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WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS

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A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPH--ETC(U)

MAY 76 S A TARBELL

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER WHOI-76-40	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS. VOLUME I (EARLY 1969 MEASUREMENTS)	5. TYPE OF REPORT & PERIOD COVERED TECHNICAL rept.	
7. AUTHOR(s) Susan A. Tarbell	6. PERFORMING ORG. REPORT NUMBER	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Woods Hole Oceanographic Institution Woods Hole, Massachusetts 02543	8. CONTRACT OR GRANT NUMBER(s) N00014-66-C-0241 N00014-76-C-0197	
11. CONTROLLING OFFICE NAME AND ADDRESS Office of Naval Research Code 480	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS NR 083-004 NR 083-400	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) (12) 120 p.	12. REPORT DATE May 1976	
	13. NUMBER OF PAGES 131	
	15. SECURITY CLASS. (of this report) UNCLASSIFIED	
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) 1. Site D 2. Current Data 3. Moorings		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) → Summaries of wind and current measurements from moored stations gathered by magnetic tape recording current meters and wind recorders in early 1969 are presented also selected hydro-station data from the same areas. Averaged wind and current quantities are presented in computer generated output as basic STATISTICS, SPECTRA diagrams, PROGRESSIVE VECTOR diagrams and EAST-NORTH component plots. The hydrostation data are presented as temperature and salinity values plotted against pressure.		

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WHOI-76-40

A COMPILATION OF MOORED CURRENT DATA AND
ASSOCIATED OCEANOGRAPHIC OBSERVATIONS,
VOLUME X (EARLY 1969 MEASUREMENTS)

by

Susan A. Tarbell

WOODS HOLE OCEANOGRAPHIC INSTITUTION
Woods Hole, Massachusetts 02543

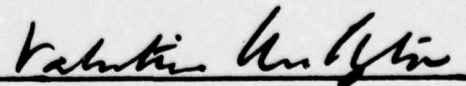
May 1976

TECHNICAL REPORT

*Prepared for the Office of Naval Research under
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N00014-76-C-0197; NR 083-400.*

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Department of Physical Oceanography

ABSTRACT

Summaries of wind and current observations from moored stations gathered in early 1969 by magnetic tape recording current meters and wind recorders are presented, also selected hydrostation data from the same areas.

Averaged wind and current variables are presented in computer generated output as basic STATISTICS, SPECTRA diagrams, PROGRESSIVE VECTOR diagrams and EAST-NORTH component plots. The hydrostation data are presented as temperature and salinity values plotted against depth.

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TABLE OF CONTENTS

	Page
PREFACE	v
ACKNOWLEDGMENTS	vi
Data Location	vii
Hydrocast Data Selection	x
Current Meter Data Selection	x
Clock	xiv
Back Up Clock Information	xiv
SHEAR TIME	xv
Data Editing	xv
Data Presentation	xvi
Mooring Summary	xvi
Data Summary	xvii
Computer Programs	xvii
Mooring 289	1
2892	3
2893	7
2894	11
2895	15
2896	19
Mooring 290	23
2903	25
2905	29
Mooring 291	33
2911	35
Mooring 294	39
2941	41
2942	45
2944	49
2945	53
2946	57
Mooring 298	61
2981	63
2983	67
Mooring 299	71
2991	73
2992	77
2995	81
2996	85
Hydrographic Data	90
References	110

PREFACE

This volume is the tenth of a series of Data Reports intended to present, in summarized form, measurements collected from moored ocean stations. The following is a list of preceding reports.

Volume 1 - Webster and Fofonoff	Data from mid 1963
Volume 2 - Webster and Fofonoff	Data from XII-'63 to V-'64
Volume 3 - Webster and Fofonoff	Data from mid 1964
Volume 4 - Pollard	Data collected in 1965
Volume 5 - Tarbell and Webster	Data collected in 1966 - AD-730 466
Volume 6 - Tarbell	Data collected in 1967 - AD-782 366
Volume 7 - Chausse and Tarbell	Data collected in 1968
Volume 8 - Pollard and Tarbell	Array data from 1970
Volume 9 - Tarbell, Briscoe and Chausse	IWEX data from 1973 - AD-A022 552

The back-up recovery system designed in 1968 (Berteaux and Heinmiller, 1969, W.H.O.I. Ref. 69-7 (unpublished manuscript) proved its worth in 1969. Tests of wire samples and wire in moorings were continued in 1969. The Gulf Stream went through Site D in April resulting in fish bite damage and a re-evaluation of mooring lines and anchor weights.

ACKNOWLEDGMENTS

Unfortunately it is impossible to acknowledge individually everyone who gave support to the Moored Buoy Program in any given year. Ideas from any source are valuable to a growing project and of course the skills of the project support personnel are invaluable. As the Project expanded, more people became involved and specialization started to divide the group into segments. The basic groups became oriented around Instrumentation, Engineering, Operations, Data Processing and of course, the glue that holds us all together, Science.

The instrumentation group became responsible not only for maintaining the instruments but also for improving them and designing equipment to test them for the various malfunctions seen in the lab and in the data.

The engineers design and test new mooring configurations and components to meet more demanding scientific needs.

The operations personnel are also the sea-going personnel. They set and retrieve the moorings and maintain all the equipment necessary for these operations as well as the individual mooring components.

The data processors decode the data and edit out known problems, then arrange the data into forms used by the scientists to interpret the data.

The scientists devise the experiments that the Buoy Group handles and evaluate the returning data.

It is the splendid cooperation among these groups that makes the Buoy Group successful and this Data Report necessary.

The patience and skill of Audrey Williams, who typed the text and tables for this report and of Ann Whitlatch, who prepared the computer plots, is greatly appreciated.

cont fr P 1473A

Data Location

▷ The data collected in 1969 were gathered from four different sites: the Mediterranean Sea, the Gulf Stream, Site L and Site D. Mooring 289 was set in the Mediterranean at $38^{\circ}01'N$, $04^{\circ}59.9'E$; moorings 304 and 305 were Gulf Stream moorings at $36^{\circ}23.4'N$, $70^{\circ}00.2'W$ and $36^{\circ}43'N$, $70^{\circ}00.3'W$ respectively. Mooring 314 was set at Site L at $34^{\circ}02.7'N$, $70^{\circ}02'W$. The rest of the data were collected from moorings set in the vicinity of Site D, $39^{\circ}10'N$, $70^{\circ}00'W$. See figures 1 and 2 for positions of the moorings relative to land.

▷ This report presents data from the first part of 1969 only. See W.H.O.I. Ref. 76-41 (unpublished manuscript) for data from late 1969.

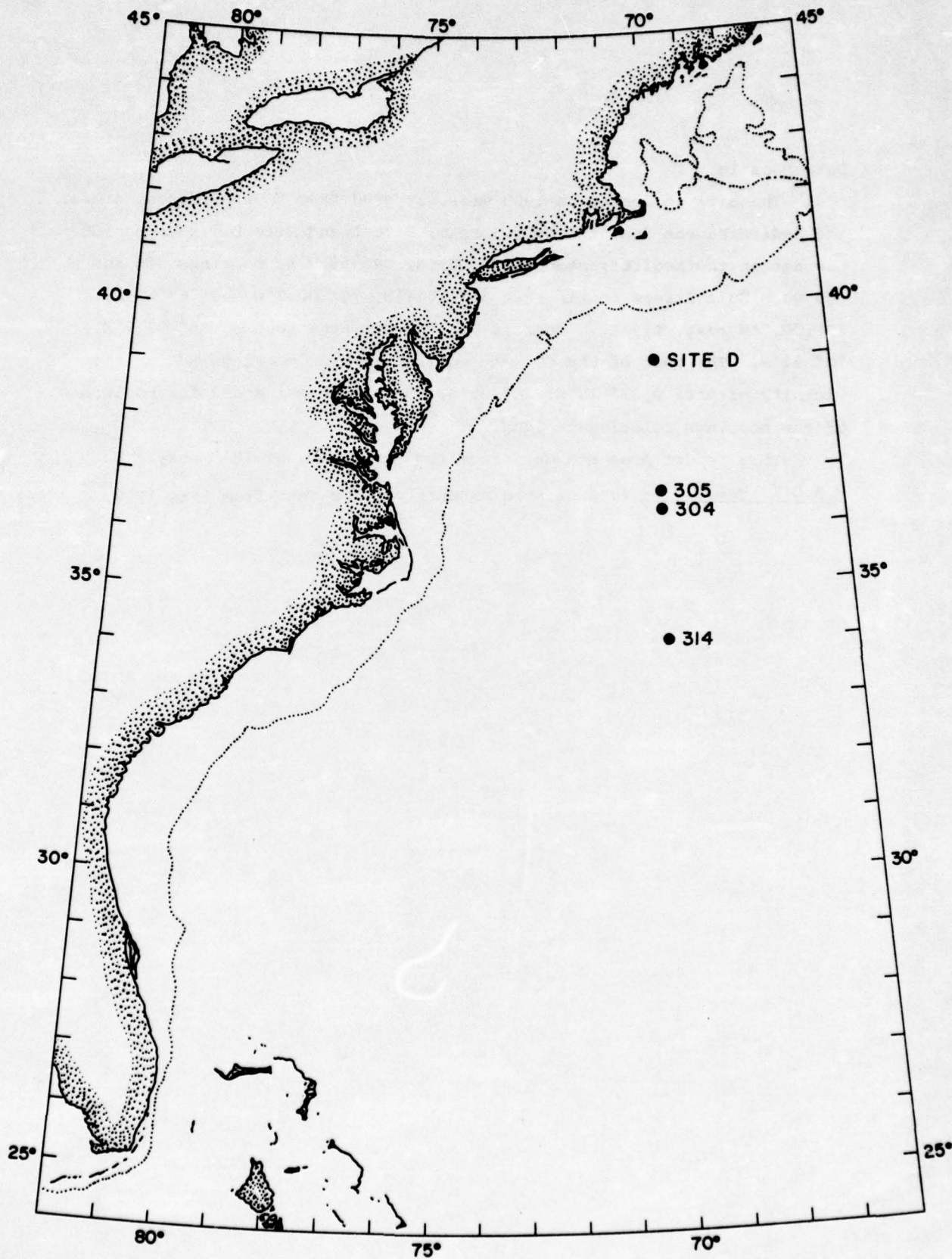


Figure 1 Mooring Sites in N.W. Atlantic

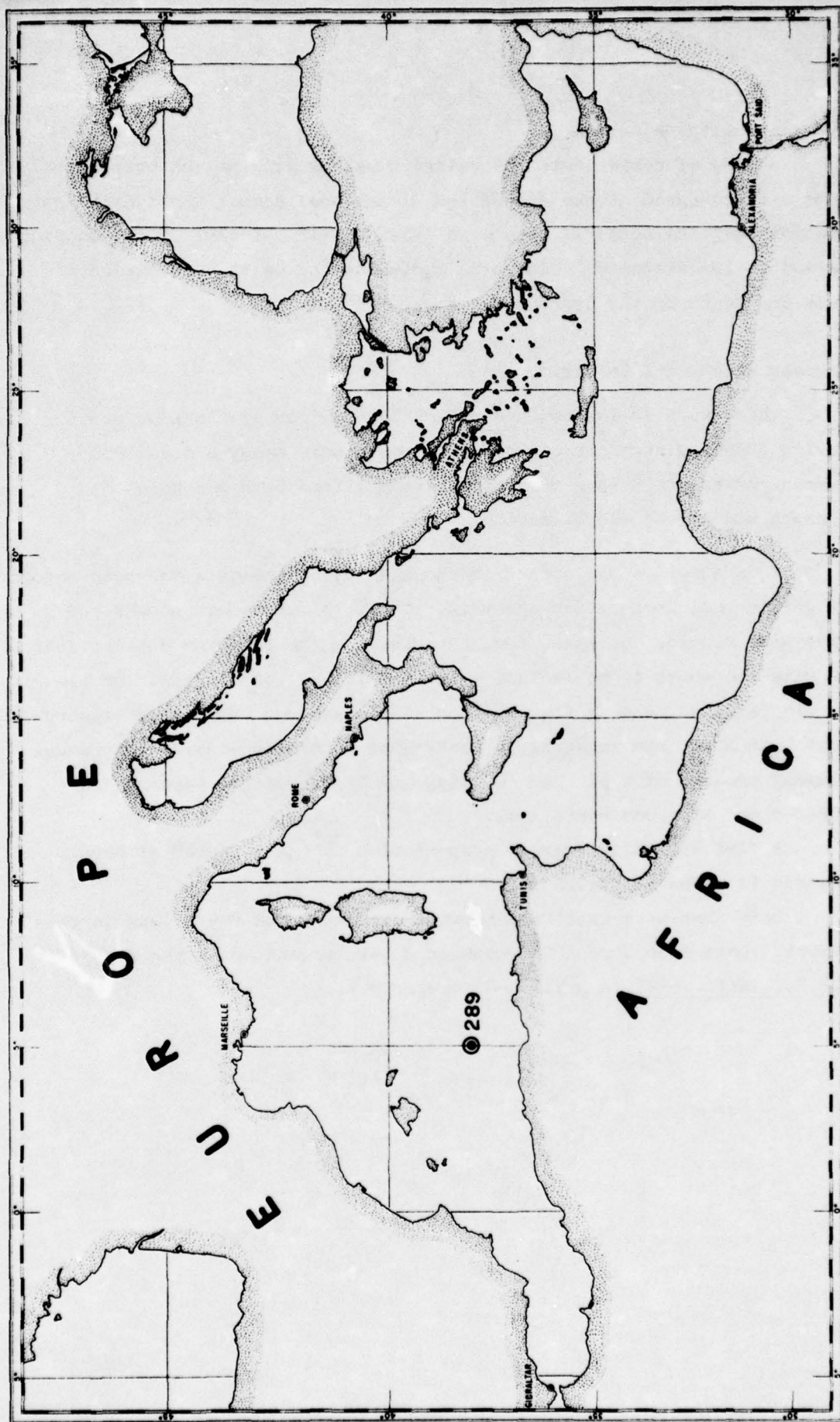


Figure 2 Mooring Site in Mediterranean Sea

Hydrocast Data Selection

Graphs of temperature and salinity values from Nansen bottle readings are presented at the end of the directional data. The hydrographic stations were selected if they were taken within two days of the mooring period in the vicinity. Figure 3A indicates the relative position in time and depth of the hydrocast data.

Current Meter Data Selection

There were 72 instruments set on 35 moorings by the Buoy Group during 1969. Sixty-four of the instruments were Geodyne model 850 current meter and 8 were current meters modified by Woods Hole to measure wind speed and direction.

A data series was chosen if the quality of the data was good enough to permit basic scientific analysis. Thirty-six current records and five wind records met these requirements. Of the rejected data series, 12 were too short to be included; another 11 had various kinds of electronic failures ranging from writing blank tape for one bits to instrument switching from interval to continuous recording mode; 1 instrument flooded because of a pinched 'O' ring and 7 instruments were not recovered and are considered lost.

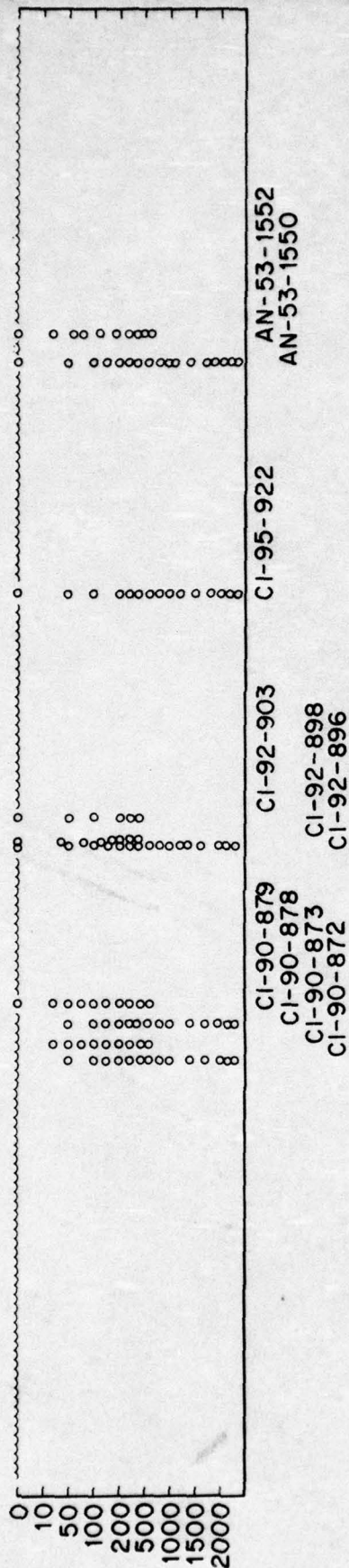
A TIME vs. DEPTH graphic presentation of the selected 41 data records is shown in figure 3B.

Data that were initiated between January 1 and May 31 are in this report. Data from June 1 to December 31 are presented in the report W.H.O.I. Ref. 76-41 (unpublished manuscript).

SITE 'D' 39°10'N 70°00'W

1969

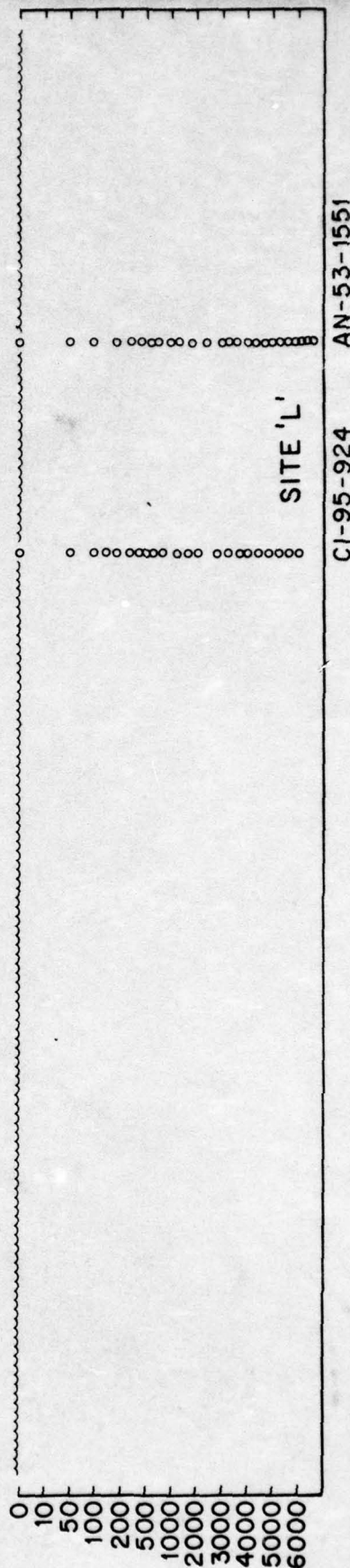
JAN. + FEB. + MARCH + APRIL + MAY + JUNE + JULY + AUG. + SEPT. + OCT. + NOV. + DEC. +



NON-SITE 'D'

1969

JAN. + FEB. + MARCH + APRIL + MAY + JUNE + JULY + AUG. + SEPT. + OCT. + NOV. + DEC. +



W.H.O.I. Ref. 76-40

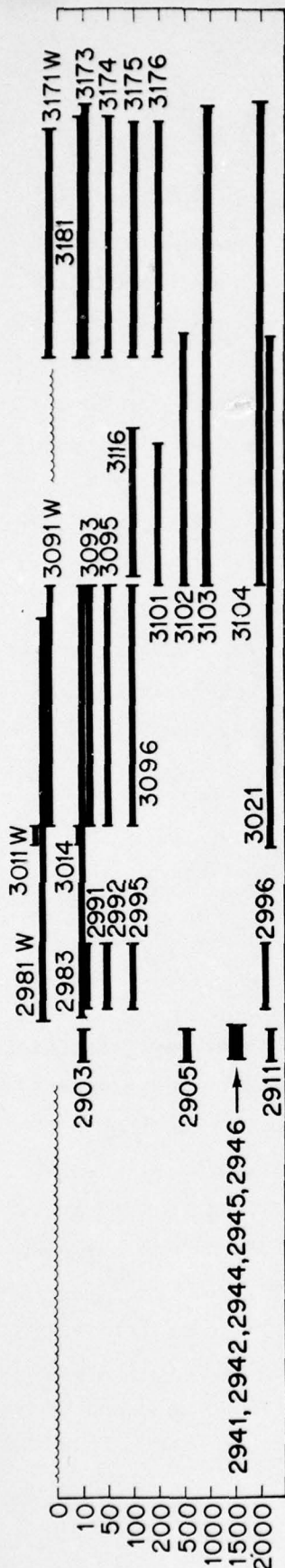
W.H.Q.I. Ref. 76-41

Figure 3A Selected Hydro Stations Collected near Mooring and Plotted According to Date and Sensor Depth

SITE 'D' 39°10'N 70°00'W

1969

JAN. + FEB. + MARCH + APRIL + MAY + JUNE + JULY + AUG. + SEPT. + OCT. + NOV. + DEC. +



NON-SITE 'D'

1969

JAN. + FEB. + MARCH + APRIL + MAY + JUNE + JULY + AUG. + SEPT. + OCT. + NOV. + DEC. +



28°01.0'N, 04°59.9'E
THE MEDITERRANEAN

36°23.4'N 70°00.2'W
36°43.0'N 70°00.3'W
34°02.7'N 70°02.0'W
SITE 'L'
GULF STREAM

W.H.O.I. Ref. 76-40

W.H.O.I. Ref. 76-41

Figure 3B Wind and Current Meter Data Duration Plotted According to Time and Sensor Depth

Clock

During early 1969 the model 850 current meters used two mechanical clocks which were wound up every two minutes by a solenoid, similar to an automobile clock. One of these clocks made 1-hour measurements and the other made 12-hour measurements. The 1-hour clock had a 4 lobe cam on the one-hour shaft which actuated a switch to turn on the recording sequence every 15 minutes. The second clock had a one lobe cam on the 12-hour shaft which also actuated a switch to insert in the data train, a 4 bit instrument number to identify 12-hour record cycles. It also served to re-arm the stop circuit that operates when the tape foil comes up at the end of the second channel of tape to shut off the instrument. The accuracy of these clocks was ± 10 seconds per day.

Data times are specified in this report in the following order: year, month, day, hour, minute and second. Therefore 69-IV-16 115712 is April 16, 1969 at 11 hours, 57 minutes and 12 seconds.

Back-up Clock Information

Another time-related activity, first tried in April, puts artificial events at the beginning and the end of each data record. These events, at known real times, provide a check on the accuracy of the clock and in case of a clock problem provide back-up time information with which the accuracy of the time base can be determined. This has proved to be a very valuable procedure for mechanical clock instruments and has also simplified the task of assigning times to data records.

The procedure to place artificial events on tape is as follows:

- A) The instrument is turned on and allowed to run for at least two recording intervals with its rotor taped so it cannot move causing a zero rotor speed on tape.

- B) During the recording cycles of two succeeding records untape the rotor and spin it to cause a speed spike.
- C) Tape the rotor again until just before launch causing more zero rotor speeds.
- D) Do not turn either the clock or the recording part of the instrument off between events and launching.

The reverse procedure applies to the recovery of instruments.

The time when the instrument started recording and the times of the rotor spins are recorded according to radio time signals from stations WWV or CHU.

This procedure also is useful with digital clock instruments in cases where the oscillator is correct but the clock word is malfunctioning.

SHEAR TIME

A program called SHEAR TIME was devised to establish best estimates of time for continuous 850 C. M. data. First, provisional linear corrections for the large clock drift rates (minutes per day) were applied, then the intervals between clock switch closures were displayed graphically. The time rate could then be adjusted with as many linear rate changes as needed to smooth the variations in the switch closures. SHEAR TIME was only used on continuous 850 current meter data which used mechanical clocks for a time base.

Data Editing

Data from both the old mechanical clock model 850 and the new crystal clock model 850 are recorded on 1/4" magnetic tape. The data were transcribed onto computer compatible 7-track tape using a PDP-5 computer (manufactured by Digital Equipment Co.). The data were then converted to Maltais format (J. Maltais, 1969) on 9-track magnetic tape.

Once the data are on tape in Maltais format, various types of editing can be done such as replacing values that are obviously bad or removing systematic instrumental errors. After the data have been edited they are vector averaged over each recording interval to give one velocity vector per interval. These vectors are listed in terms of speed and direction. The launch and retrieval transients are truncated and any remaining bad points are deleted and replaced by linearly interpolated values. The result is an evenly spaced time series called the best basic vector averaged series which is used as input for all further processing.

To insure that each data series has a unique identifier, a set of informal guidelines has been established. For example, 2981WL900

298 - The first three digits are the mooring number.

1 - The fourth digit indicates the position of the instrument on the mooring counting from the top down.

W - When present "W" signifies a wind recorder, a "Y" would signify that the data has been read by eye.

L - Indicates that some editing has been done. The amount of editing done can usually be inferred by the position of the letter in the alphabet. If no editing has been done the symbol \$ is used.

900 - The averaging interval, 900 seconds. 1H would indicate a 1-hour averaging interval.

Data Presentation

Data from wind and current recording instruments are presented first, followed by a section of selected hydrostation data.

The data from each mooring follow a two-page description of that mooring. The data from each selected series are presented with 1 page of instrument information and 3 pages of data displays.

Mooring Summary

The first page of the mooring summary is a diagram of the mooring. The second page contains general information on the mooring. For more detailed information on the moorings set in 1969 see G. Volkmann, 1970, W.H.O.I. Ref. 70-37 (unpublished manuscript).

The mooring page uses the following:

*	data presented
M.C.M.	magnetic tape recording current meters
M.W.R.	magnetic tape recording wind recorders
Tens.	tensiometer
Tel. Tens.	telemetering tensiometer
D.R.	depth recorder
Temp.	temperature recorder
Volt. Dig.	voltage digitizer
Vib/Ten	tensiometer with accelerometer added to measure vibration
Press. Rec.	pressure recorder

Data Summary

The first page of the data summary lists the main features of the data series collected from that instrument. The type of instrument, the sampling scheme, and the timing of the sampling are listed as are the start and stop times of the useable data. All times are Greenwich Mean Time. If the instrument did not work properly, comments on its behavior and the data quality are written under the comments section. Some standard statistical parameters are calculated for the data and are presented on the bottom of the first page. The formulas used to calculate the statistical parameters and descriptions of the various plots used to present the data on the following three pages are described below.

Histograms

Histograms of speed are plotted. The plots may be thought of as approximations to the probability density functions. The vertical axis labeled "relative frequency per unit cell width" shows the percentage of the total record that occurred within a given interval of the horizontal axis. The area under the curve equals 100%.

Statistics (STATS)

Standard statistical parameters are calculated for data in the time range given at the bottom of the table. If there are n speed and direction values in a sample, and we define $E_i = s_i \sin \theta_i$, $N_i = s_i \cos \theta_i$, then for $A = E, N$, and s ,

$$\text{mean, } \bar{A} = \frac{1}{n} \sum_{i=1}^n A_i$$

$$\text{variance, } \sigma_A^2 = \frac{1}{n} \sum_{i=1}^n A_i^2 - \bar{A}^2$$

$$\text{standard error of the mean} = \frac{\sigma_A}{\sqrt{n}}$$

$$\text{standard deviation} = \sigma_A$$

$$\text{skewness} = \frac{1}{\sigma_A^3} \left[\frac{1}{n} \sum_{i=1}^n A_i^3 - \frac{3\bar{A}}{n} \sum_{i=1}^n A_i^2 + 2\bar{A}^3 \right]$$

$$\text{kurtosis} = \frac{1}{\sigma_A^4} \left[\frac{1}{n} \sum_{i=1}^n A_i^4 - \frac{4\bar{A}}{n} \sum_{i=1}^n A_i^3 + \frac{6\bar{A}^2}{n} \sum_{i=1}^n A_i^2 - 3\bar{A}^4 \right]$$

The program also computes "East and North" statistics,

$$\text{covariance, } M = \frac{1}{n} \sum_{i=1}^n E_i N_i - \bar{E} \bar{N}$$

$$\text{standard deviation of covariance, } \sigma_m = \frac{1}{n} \sum_{i=1}^n (E_i N_i)^2 - \overline{E_i N_i}^2$$

$$\text{standard error of covariance} = \frac{\sigma_m}{\sqrt{n}}$$

$$\text{correlation coefficient, } M' = \frac{M}{\sigma_E \sigma_N}$$

STATS also computes these parameters related to vector quantities:

the scalar amplitude of the vector mean, $V_m = \sqrt{\bar{E}^2 + \bar{N}^2}$; vector variance,

$$V_v^2 = \frac{1}{2} (\sigma_E^2 + \sigma_N^2); \text{ standard deviation} = V_v.$$

East vs. North Scatterplot

The EAST and NORTH components are plotted against each other to give a pictorial indication of the DIRECTION and SPEED of the velocity vectors. This type plot can be helpful in finding instrument malfunctions and characteristics not easily noticed elsewhere.

Progressive Vector Diagram (PROVEC)

The EAST and NORTH progressive displacements are computed from the SPEED and DIRECTION values of one recording cycle. The plot begins with

an asterisk (*) on a day boundary. All following day boundaries are indicated with a (+). This type of plot accentuates very low frequency events at the expense of higher frequency oscillations which may be hidden by a large amplitude low-frequency current.

Variable vs. Time Plot

This is a diagram of EAST and NORTH components plotted as a function of TIME. The plot is generated from the basic vector averaged series. This type of plot is complementary to the PROGRESSIVE VECTOR diagram since it accentuates higher frequency events such as inertial and tidal oscillations.

Spectra

The program TIMSAN (Time Series Analysis) uses the Fast Fourier Transform algorithm of Singleton (1969) and is restricted to data segments of length N points, where N must contain no prime factor larger than 5, and must be less than 8000 points; data series longer than this must be broken into two or more pieces.

The number of degrees of freedom for the first 40 plotted points is given by $v = a m s$ where m is the number of adjacent frequency bands being averaged as stated in the label, s is the number of independent data pieces being averaged, again as stated in the label, and a should be two for temperature spectra and for Horizontal Kinetic [HKE] spectra for which the EAST and NORTH components seem statistically independent. In the absence of information regarding NORTH-EAST correlation, one should use $a = 2$ to be safe.

The log-log plot is further averaged during plotting so that more and more points are averaged together as frequency increases. This eliminates the bunching together of points at high frequencies, increases the degrees of freedom of the high frequency estimates, and still permits low-frequency resolution. The averaging algorithm is as follows: counting from the left of the plot, the first 40 plotted points represent data that has been averaged as stated in the label; the data for the next 15 plotted points has been averaged over twice as many frequency bands;

the next 6 over five times as many, the next 40 over ten times as many, the next 15 over twenty times as many, the next 6 over fifty times as many, the next 40 over 100 times as many and so on. In this way, for example, 7900 data points with no averaging indicated in the label would be plotted as only 176 points, and the last 14 estimates would be averaged over 200 basic frequency bands. The m in the formula $v = a m s$ for degrees of freedom is, in this example, 200 times larger at the highest frequencies than at the lowest frequencies.

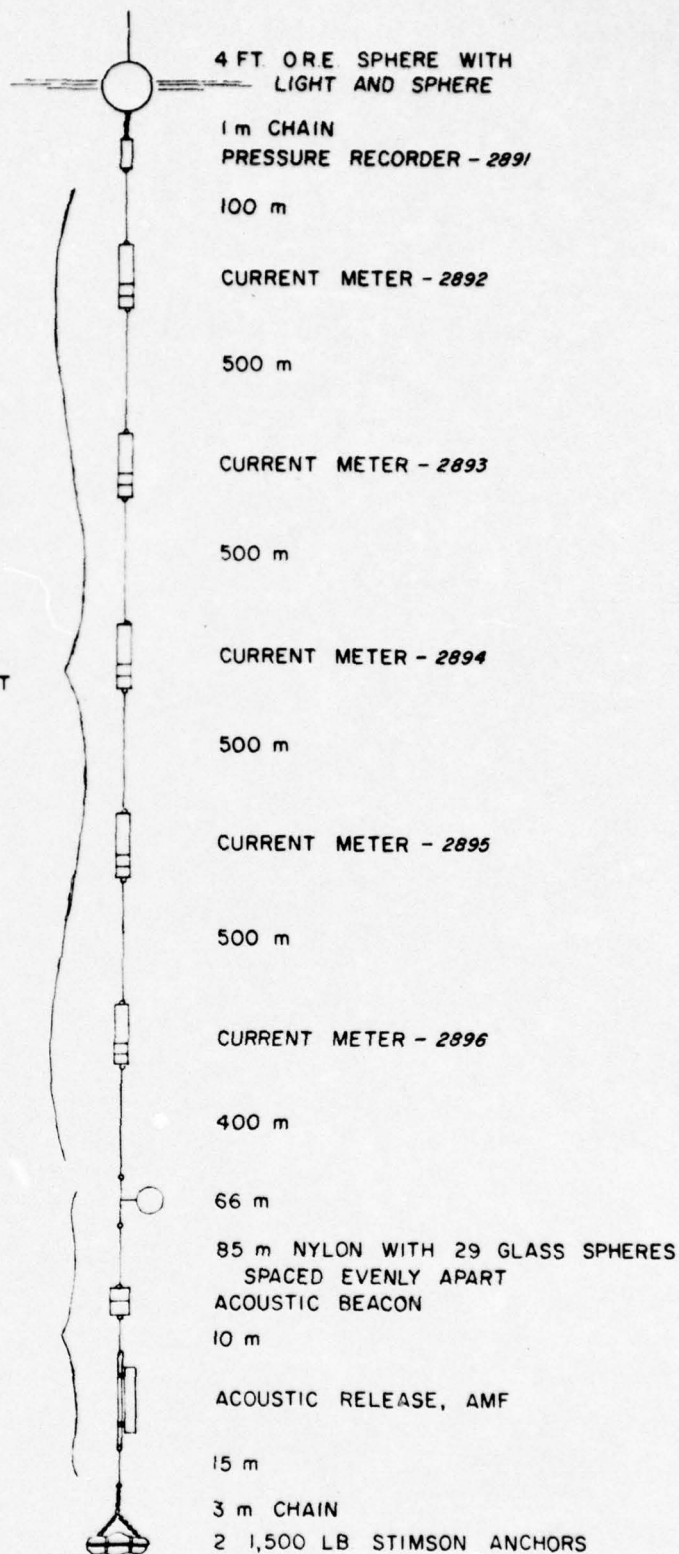
For $v > 30$, the confidence limits for the spectral estimates are given approximately by $(1 - 2/9v \pm Z\sqrt{2/9v})^{1/3}$ where $Z = 1.28375$ for 80% confidence limits, $Z = 1.645$ for 90%, $Z = 1.96$ for 95% and $Z = 2.5757$ for 99%. In the example above, if the HKE spectral plot label had indicated 2 pieces and averaging over 8 adjacent frequency bands then $v = 2 \times 2 \times 8 = 32$ for the lowest 40 frequencies (assuming NORTH and EAST components are highly correlated) and $200 \times 32 = 6400$ for the highest frequencies. The 95% confidence intervals (i.e., 95% of the time one would expect the spectral estimates to vary no more than this much) would be (0.57, 1.55) at low frequencies, and (0.97, 1.03) at high frequencies.

For $v \leq 30$, one must obtain confidence intervals from Chi-Squared distribution tables in standard statistical references.

STATION 289

1/8" TOW CABLE WITH
POLYETHYLENE JACKET

5/8" PLAITED NYLON



Mooring No. 289

Set 69 Jan 22
Year Month Day

38° 01.0N
Latitude

04° 59.9E
Longitude

Set by R. Heinmiller

Ship R. V. Atlantis II

Cruise 49

Retrieved 69 Mar 12
Year Month Day

Retrieved by J. Gifford

Ship R. V. Atlantis II

Cruise 49

Purpose of Mooring: To investigate vertical distribution of inertial disturbances
on the south side of an enclosed basin (the Mediterranean).

Mooring Type: Subsurface

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2891	T-463	Press. Rec.	123	
2892*	M-209	M.C.M.	211	
2893*	M-205	M.C.M.	713	
2894*	M-206	M.C.M.	1215	
2895*	M-210	M.C.M.	1717	
2896*	M-211	M.C.M.	2219	

Water Depth

2833

COMMENTS ON MOORING:

Instrument No.: M-209Type: Magnetic tape current meterDepth: 211 mWater depth: 2833 mStart time: 69-I-23 001900Stop time: 69-III-12 101900Duration: 48d 10hSampling scheme: Interval

time between strobos = 5 seconds

no. of strobos per interval = 24

interval time = 900 seconds

COMMENTS:

The clock information on this data file was extensively edited by Dr. H. Perkins for his thesis. The data presented here have had bad data values removed but not the Perkins time adjustment. Time difference is less than two hours.

STATS

DATA/ 28920900

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN	= -8.95	20.71	78.66	= COVARIANCE	=	-322.93
STD. ERR.	= .83	.92	.56	= STD. ERR. OF COVARIANCE	=	52.73
VARIANCE	= 3184.91	3963.43	1449.73	= STD. DEV. OF COVARIANCE	=	3585.40
STD. DEV.	= 56.26	62.96	38.08	= CORRELATION COEFFICIENT	=	-.091
KURTOSIS	= 2.42	2.81	9.61	= VECTOR MEAN	=	22.56
SKEWNESS	= -.15	.18	.86	= VECTOR VARIANCE	=	3584.17
				= STD. DEV.	=	59.70

UNITS OF RAW DATA VARIABLES = MM/SEC

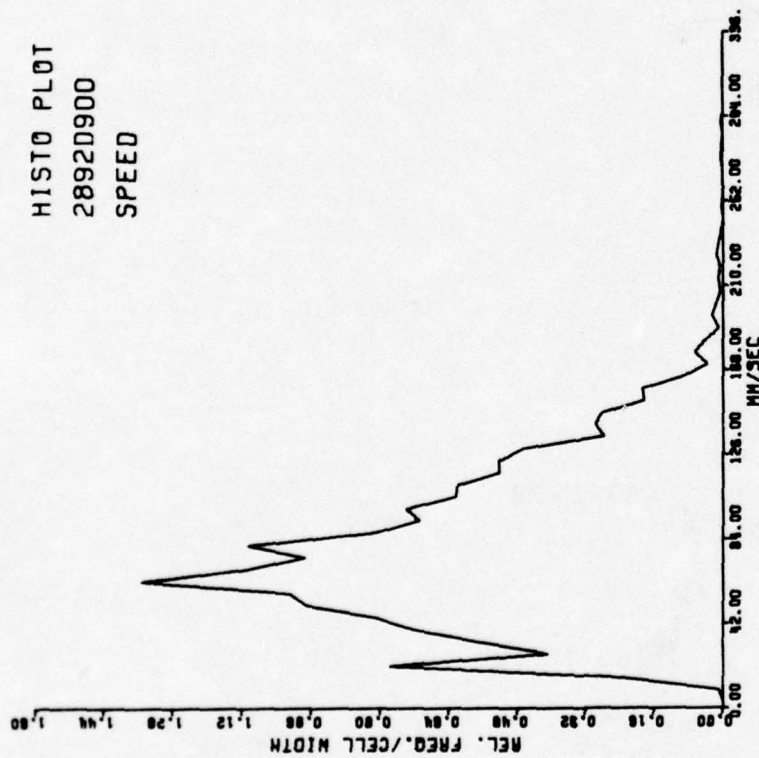
SAMPLE SIZE = 4649 POINTS

SPANNING RANGE

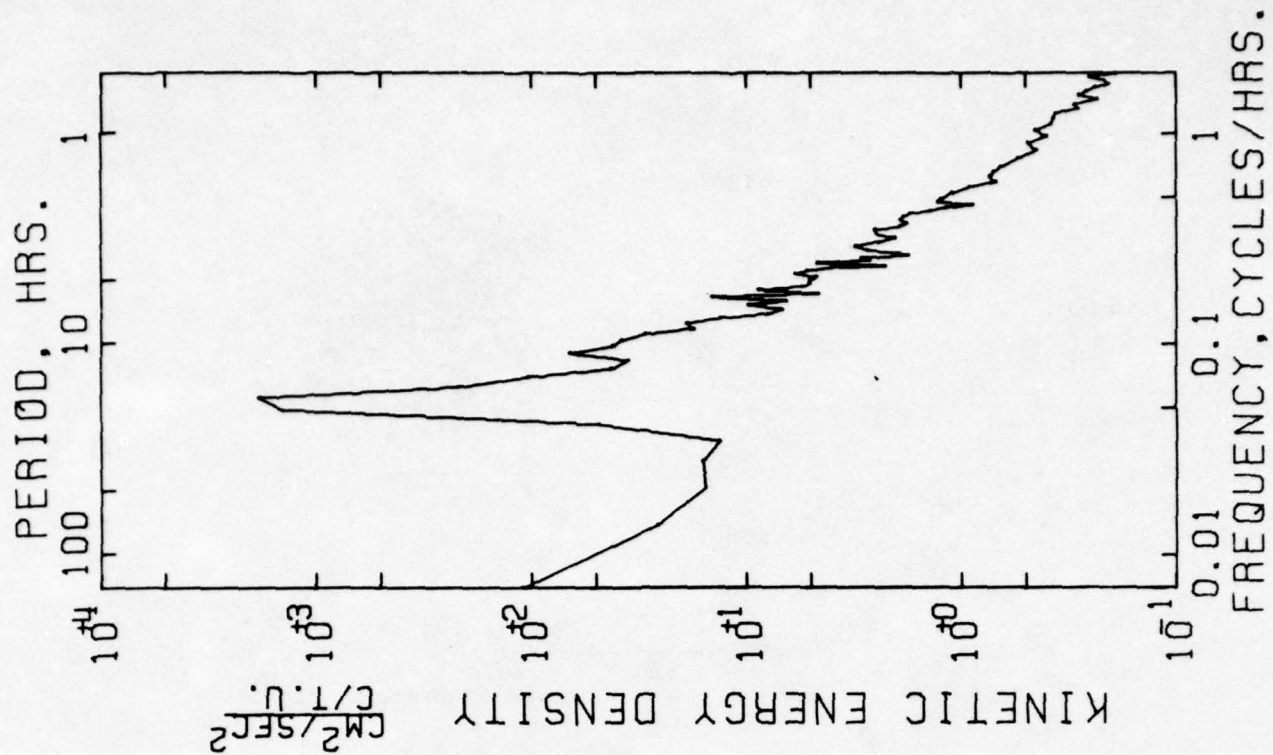
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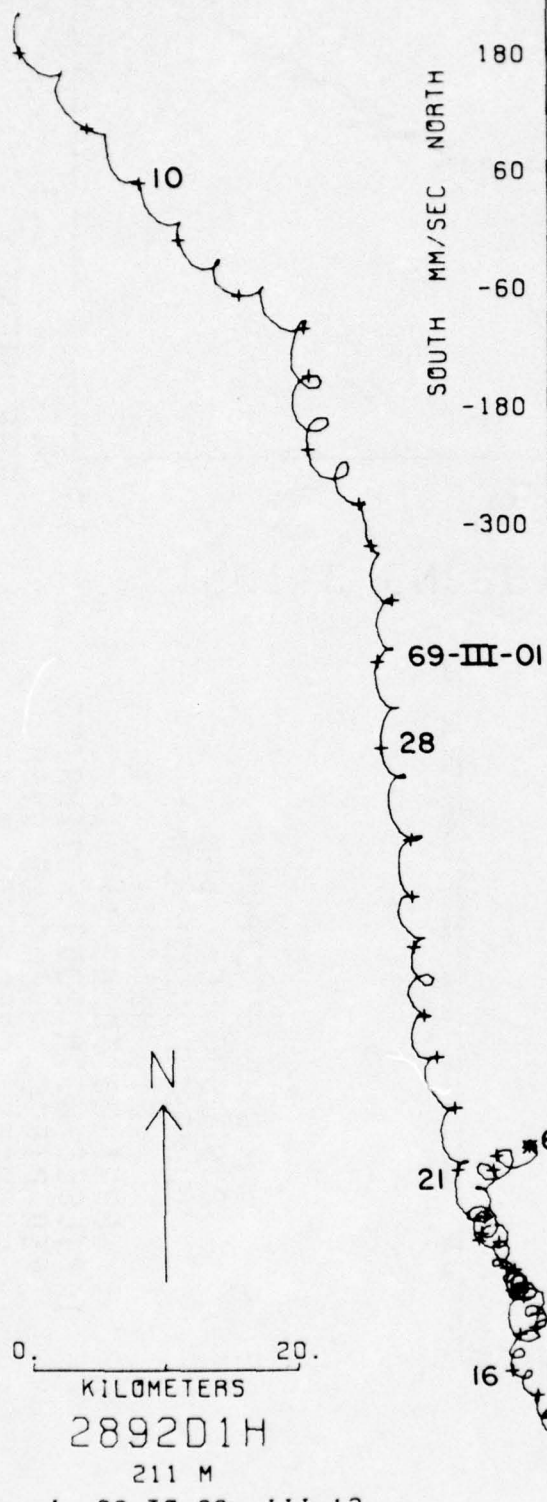
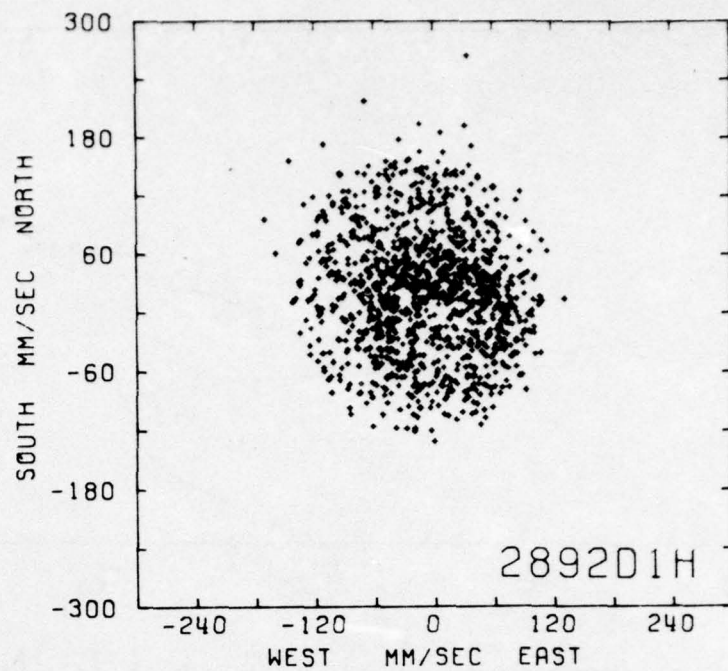
TO 69- III-12 10.19.00

DURATION 48 DAYS 10 H 0 M 0 S



AUTO SPECTRUM
28920900 EAST COMP
28920900 NORTH COMP
211 METERS
69-I-23 TO 69-III-12
1 PIECES WITH 2304 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



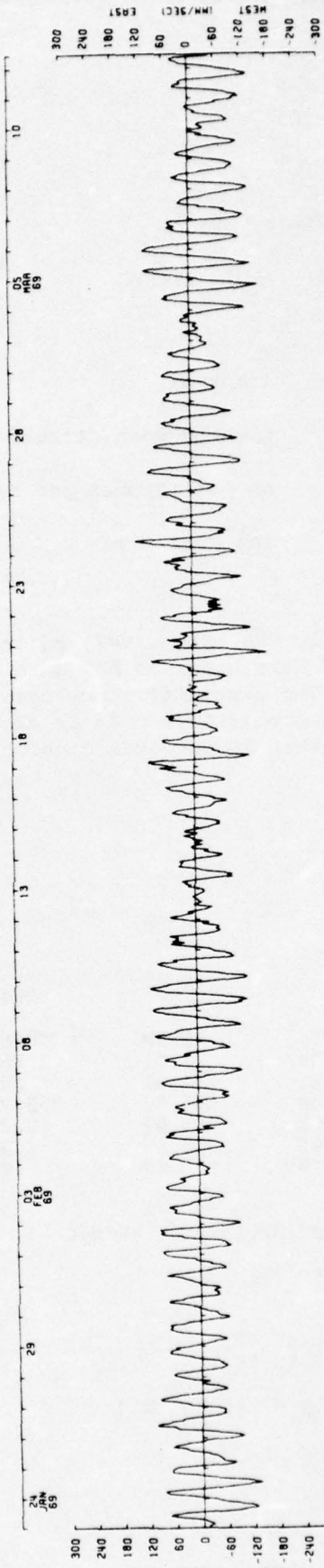
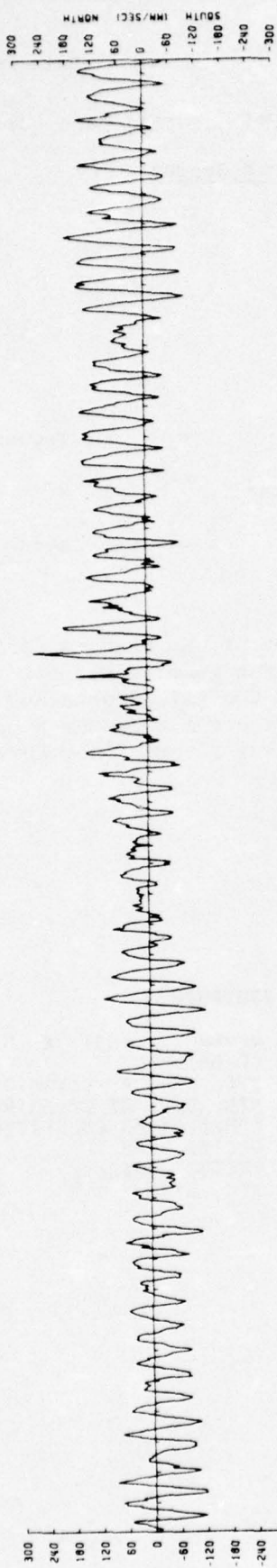


0. 20.
KILOMETERS

2892D1H

211 M

69- I -23 TO 69- III-12



289201H
211 N

Instrument No.: M-205Type: Magnetic tape current meterDepth: 713 mWater depth: 2833 mStart time: 69-I-22 225800Stop time: 69-III-03 174300Duration: 39d 18h 45mSampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

This data file was extensively edited by Dr. H. Perkins for his thesis. The data presented here have had bad data values removed but not the Perkins time adjustment. The time difference between the edited data and the collected data is about 8 days. It is as if the collected data had sampled at a rate greater than 900 seconds causing fewer records therefore less time.

STATS

DATA/ 28930900

	EAST	NORTH
MEAN	-14.79	-7.01
STD. ERR.	.43	.41
VARIANCE	710.46	648.86
STD. DEV.	26.65	25.47
KURTOSIS	2.85	3.27
SKEWNESS	.13	-.20

SPEED	EAST & NORTH	
35.97	COVARIANCE	-117.12
.30	STD. ERR. OF COVARIANCE	12.79
333.27	STD. DEV. OF COVARIANCE	780.61
18.26	CORRELATION COEFFICIENT	-.172
2.31	VECTOR MEAN	16.37
.85	VECTOR VARIANCE	679.66
	STD. DEV.	26.07

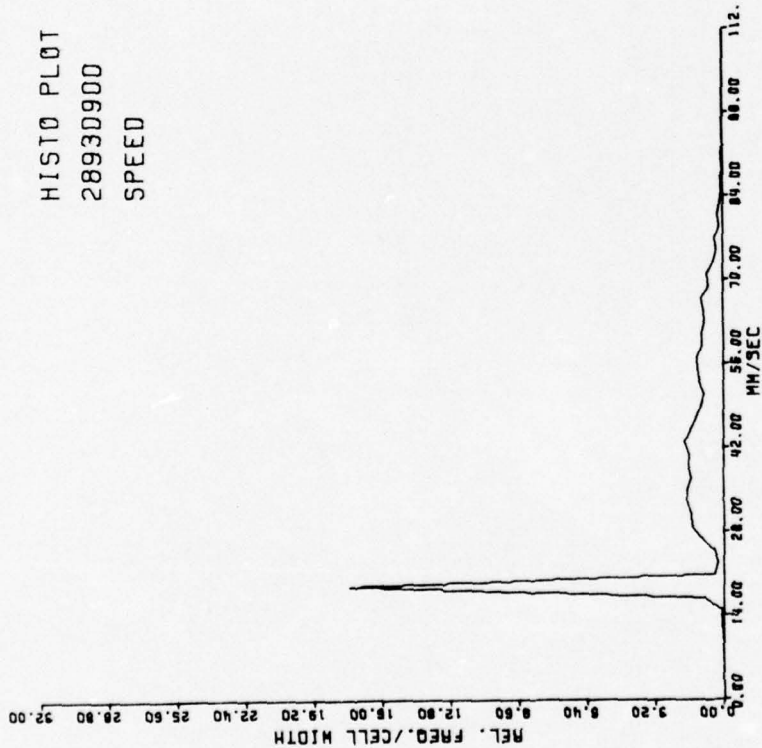
UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 3820 POINTS

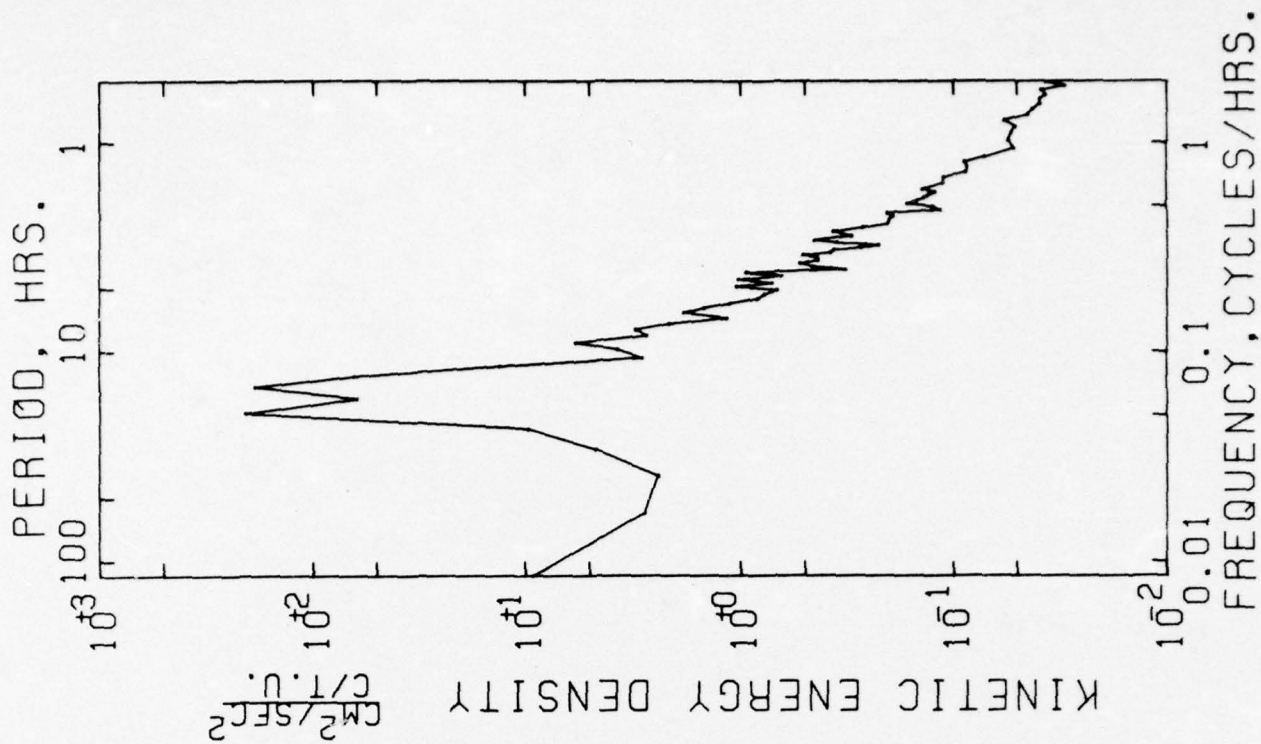
SPANNING RANGE

FROM 69- I -22 22.58.00
TO 69- III-03 17.43.00

DURATION 39 DAYS 18 H 45 M 0 S



AUTO SPECTRUM
2893D900 EAST COMP
2893D900 NORTH COMP
713 METERS
69-1-22 TO 69-111-03
1 PIECES WITH 1875 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



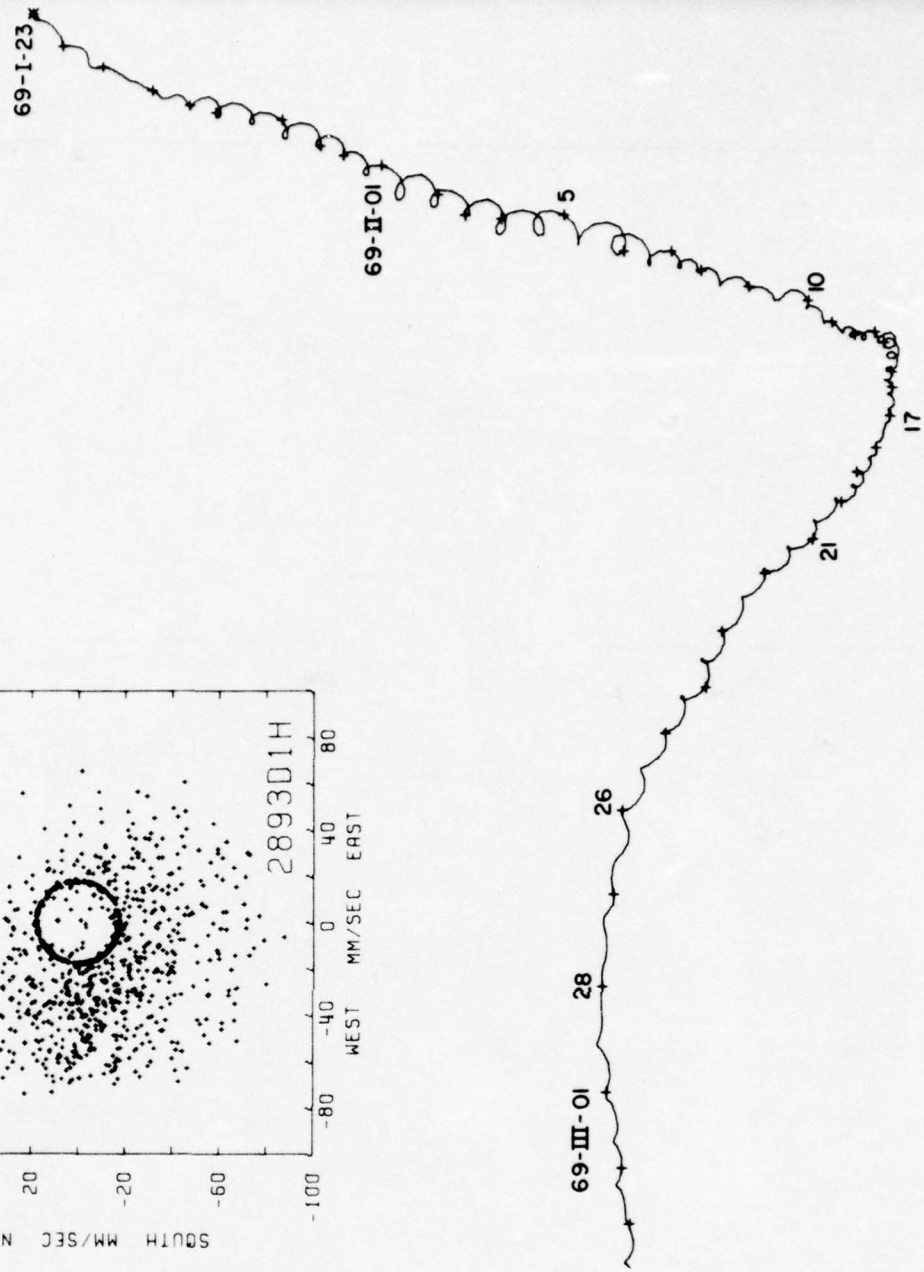
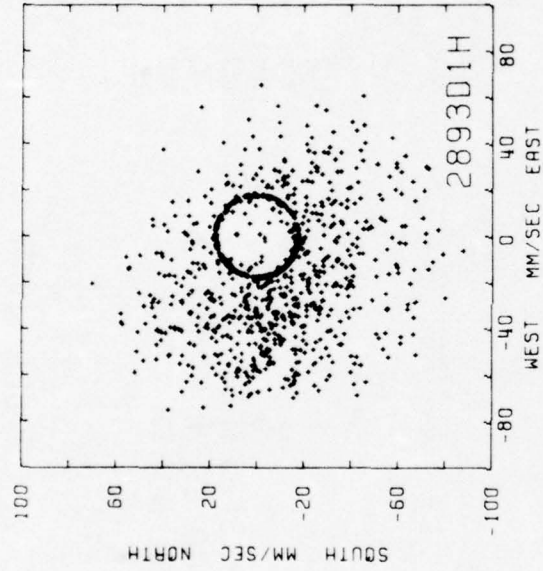
N

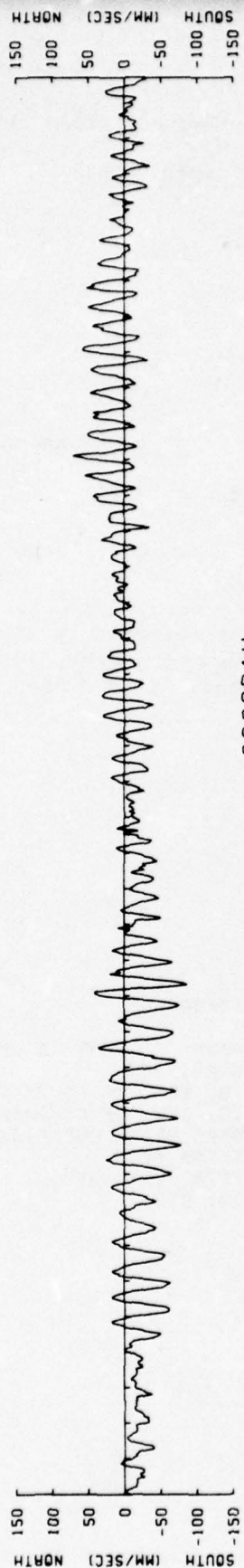
0 10
KILOMETERS

2893D1H

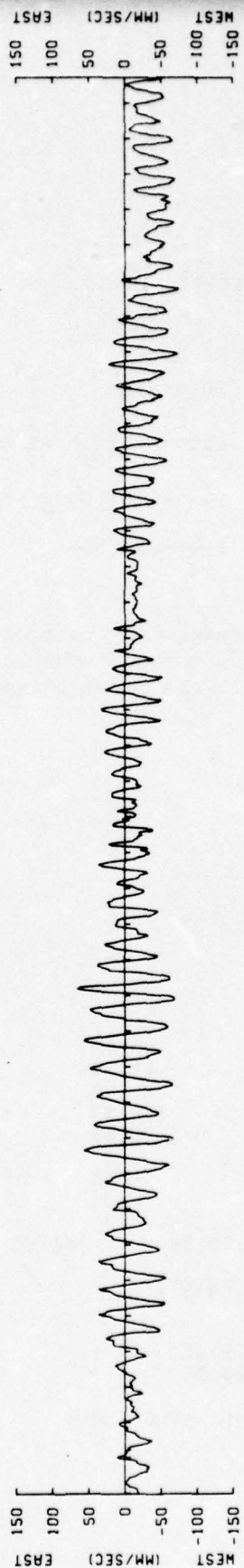
713 M

69- I -23 TO 69- III-03





289301H
713 M



Data number 2894

Instrument No.: M-206

Type: Magnetic tape current meter

Depth: 1215 m

Water depth: 2833 m

Start time: 69-I-22 232500

Stop time: 69-III-11 122500

Duration: 47d 13h

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

The clock information on this data file was extensively edited by Dr. H. Perkins for his thesis. The data presented here have had bad data values removed but not the Perkins time adjustment. Time difference is less than two hours.

STATS

DATA/ 2894F900

	EAST	NORTH	SPEED	EAST & NORTH	
MEAN	-13.61	-11.26	31.17		-109.76
STD. ERR.	.31	.29	.20		7.31
VARIANCE	445.70	393.37	179.18		494.20
STD. DEV.	21.11	19.83	13.39		-1.262
KURTOSIS	2.69	2.81	2.69		17.66
SKEWNESS	.04	-.06	.78		419.54
					20.48

UNITS OF RAW DATA VARIABLES = MM/SEC

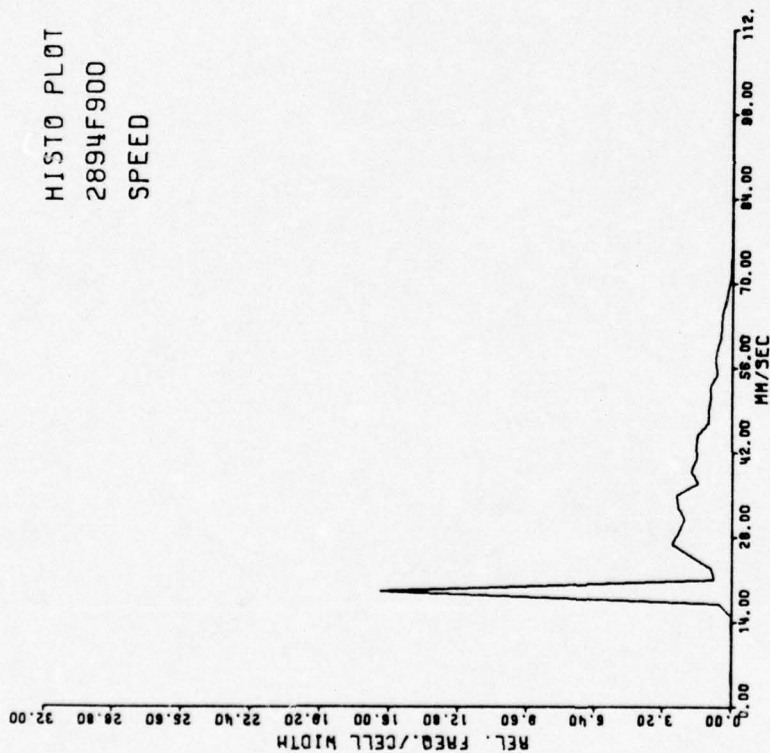
SAMPLE SIZE = 4565 POINTS

SPANNING RANGE

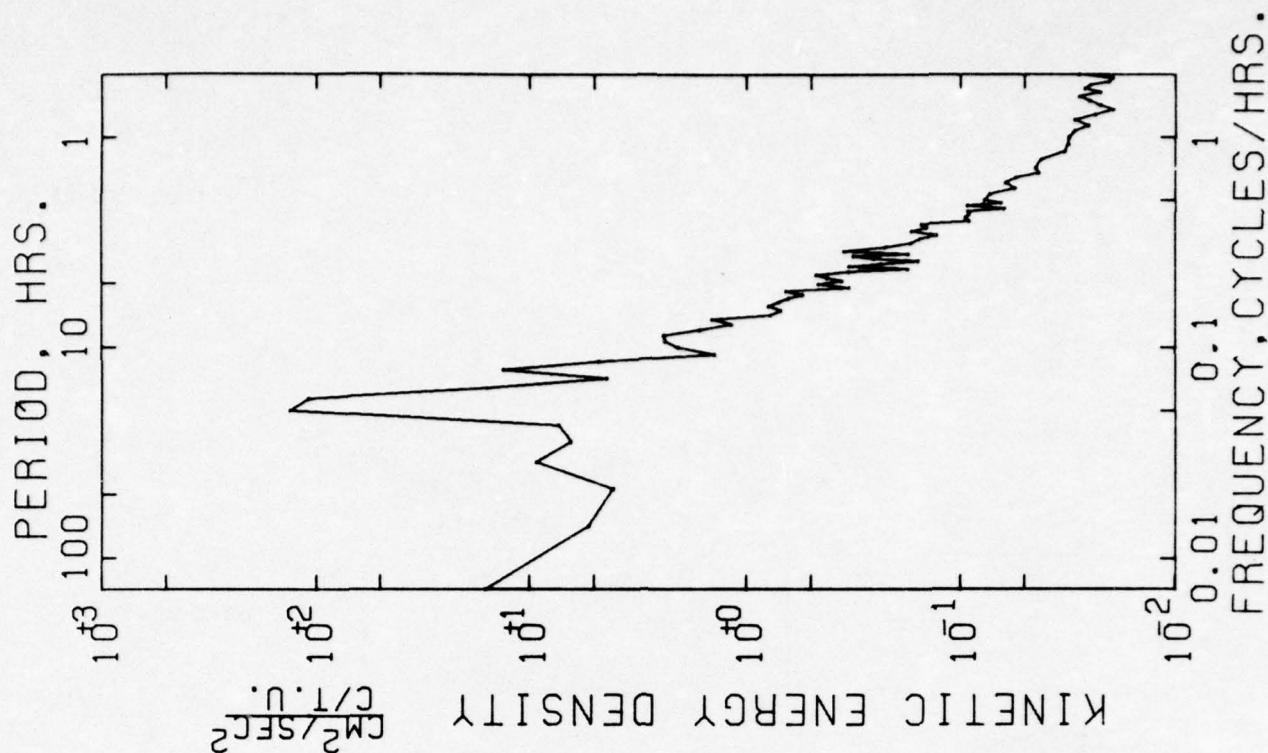
FROM 69- I -22 23.25.00

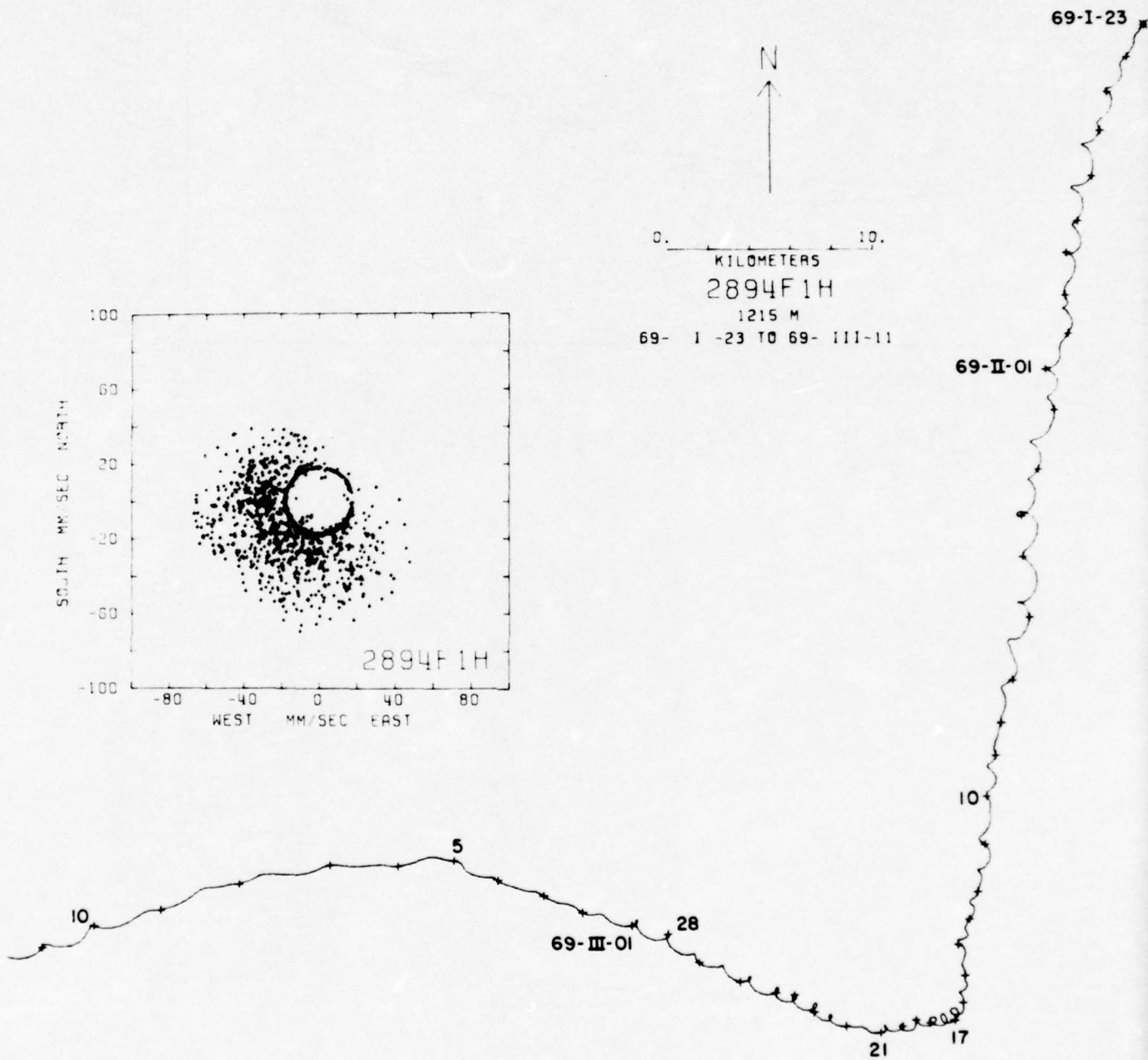
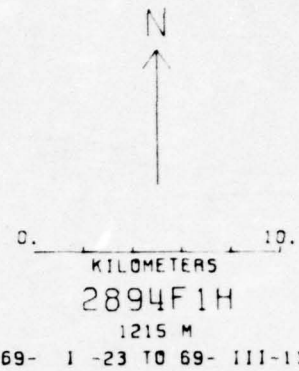
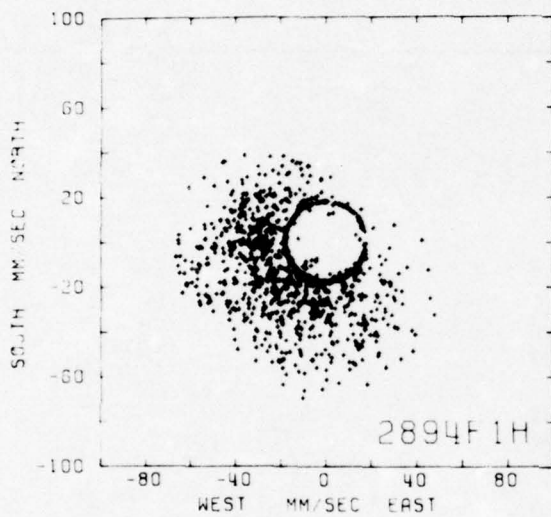
TO 69- III-11 12.25.00

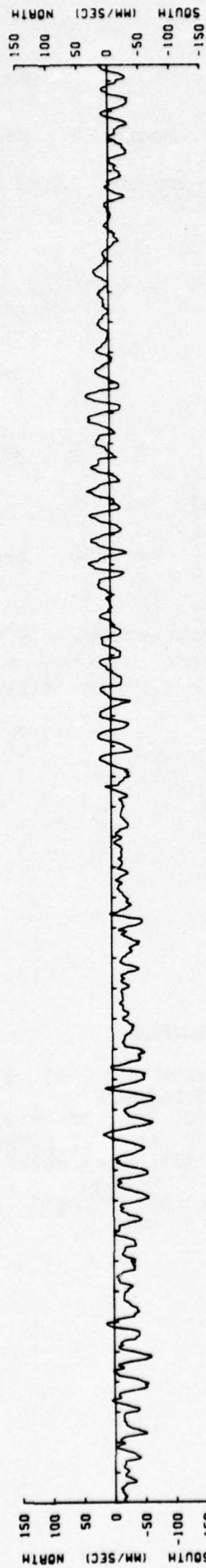
DURATION 47 DAYS 13 H 0 M 0 S



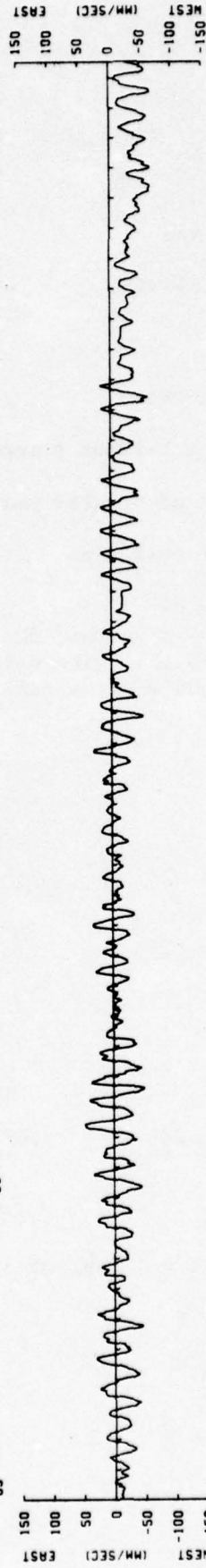
AUTO SPECTRUM
2894F900 EAST COMP
2894F900 NORTH COMP
1215 METERS
69-1-22 TO 69-111-10
1 PIECES WITH 2250 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS







2894F1H
1215 H



Data number 2895

Instrument No.: M-210

Type: Magnetic tape current meter

Depth: 1717 m

Water depth: 2833 m

Start time: 69-I-23 001435

Stop time: 69-III-12 101435

Duration: 48d 10h

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

The clock information on this data file was extensively edited by Dr. H. Perkins for his thesis. The data presented here have had bad data values removed but not the Perkins time adjustment. Time difference is less than two hours.

STATS

DATA/ 2895G900

MEAN	=	EAST	NORTH	SPEED	=	*****	EAST & NORTH	*****
STD. ERR.	=	-15.86	-7.86	39.55	=	COVARIANCE	=	-61.31
VARIANCE	=	.44	.42	.32	=	STD. ERR. OF COVARIANCE	=	15.82
STD. DEV.	=	909.35	825.12	484.98	=	STD. DEV. OF COVARIANCE	=	1085.18
KURTOSIS	=	30.16	28.72	22.02	=	CORRELATION COEFFICIENT	=	-.071
SKEWNESS	=	9.59	9.94	9.24	=	VECTOR MEAN	=	17.79
		.58	-1.00	1.01	=	VECTOR VARIANCE	=	867.29
					=	STD. DEV.	=	29.45

UNITS OF RAW DATA VARIABLES = MM/SEC

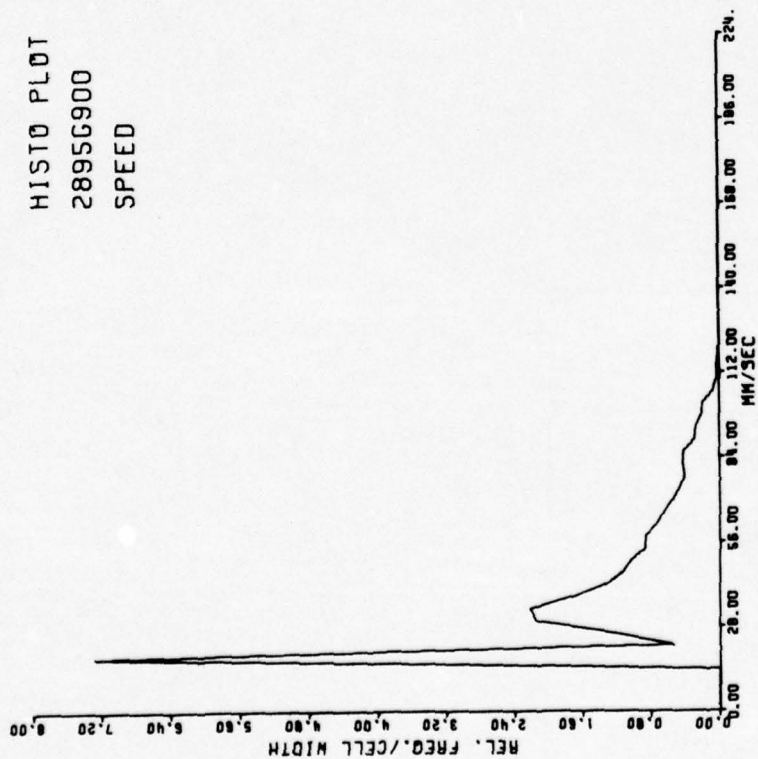
SAMPLE SIZE = 4649 POINTS

SPANNING RANGE

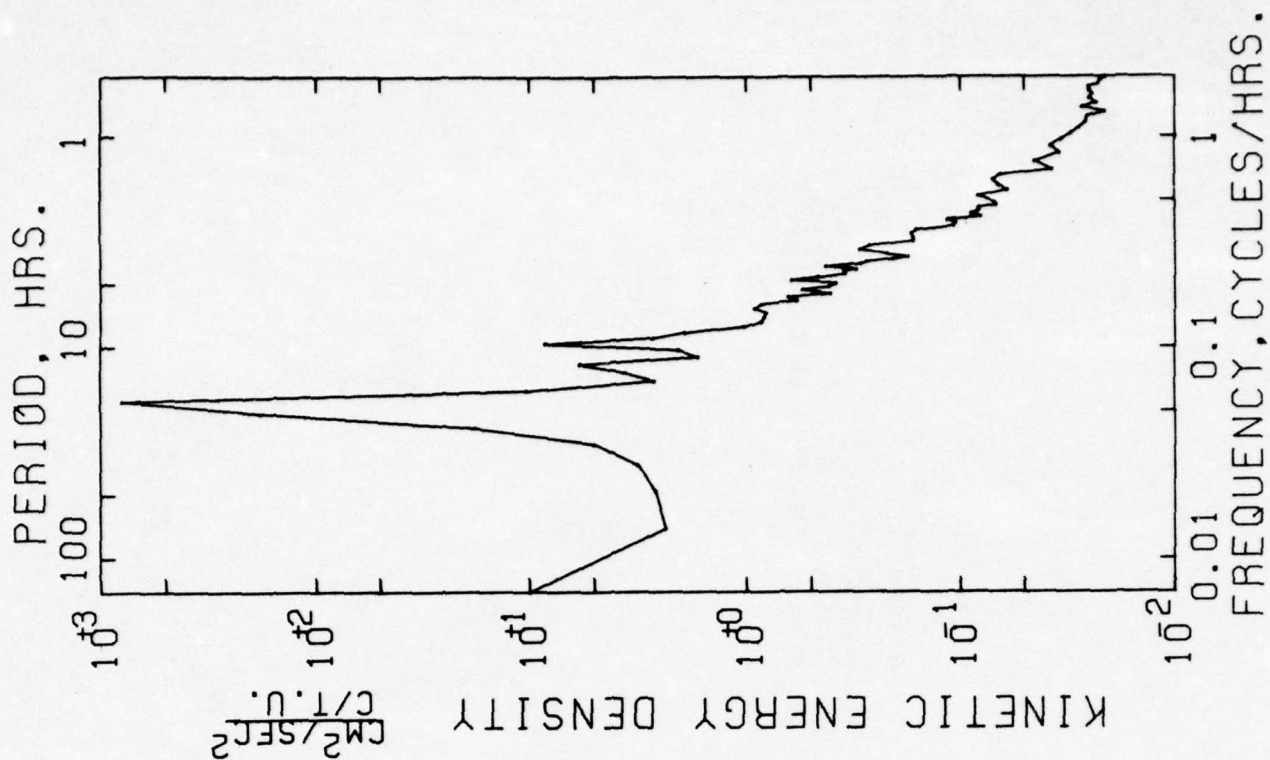
FROM 69- I -23 00.14.35

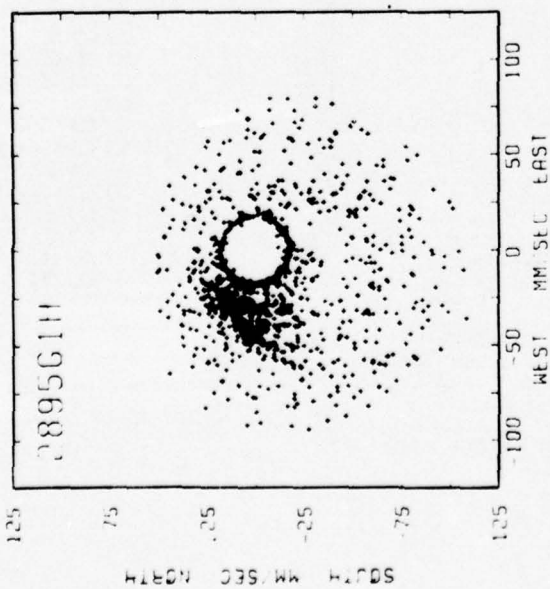
TO 69- III-12 10.14.35

DURATION 48 DAYS 10 H 0 M 0 S



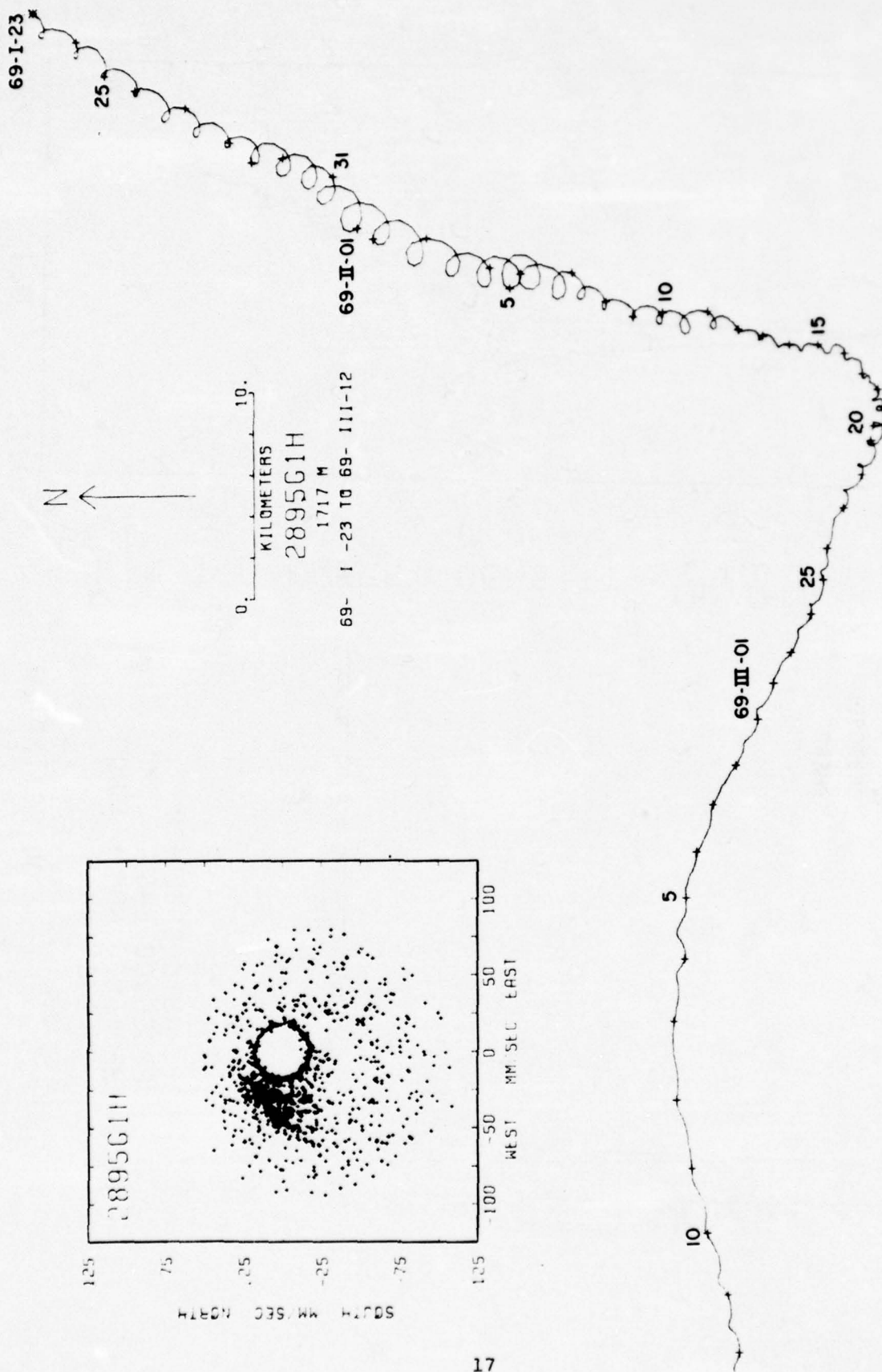
AUTO SPECTRUM
2895G900 EAST COMP
2895G900 NORTH COMP
1717 METERS
69-I-23 TO 69-J11-11
1 PIECES WITH 2304 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

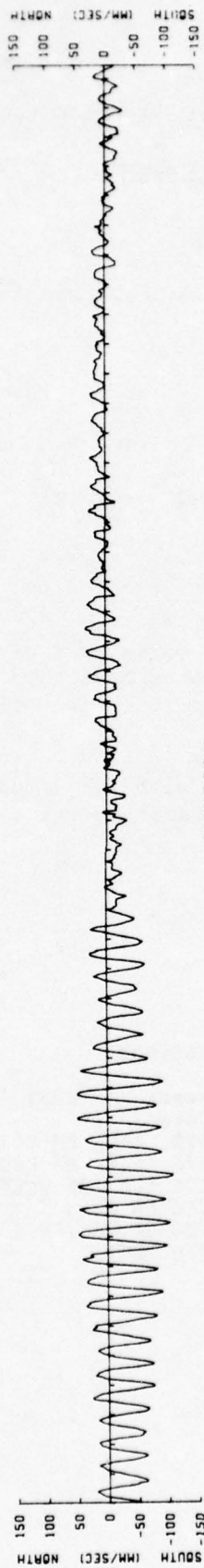




N

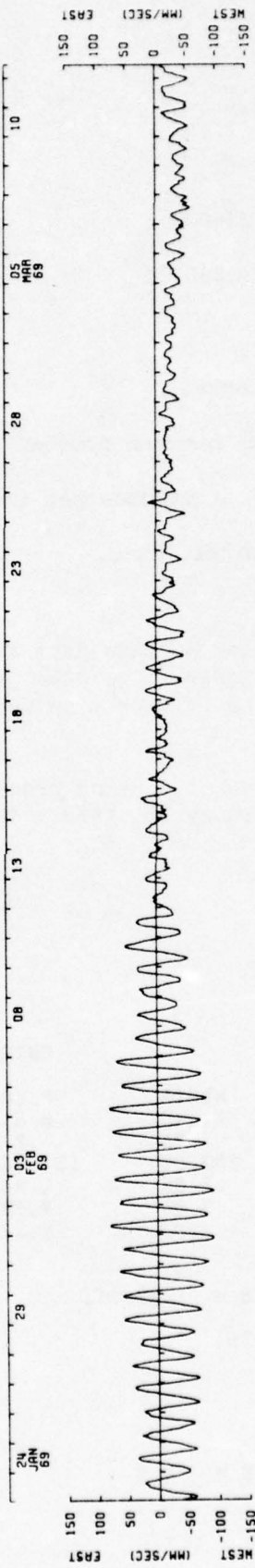
0. 10.
KILOMETERS
289561H
1717 M
69- I -23 TO 69- III-12





2895G1H
1717 M

18



Instrument No.: M-211Type: Magnetic tape current meterDepth: 2219 mWater depth: 2833 mStart time: 69-I-22 224800Stop time: 69-II-22 090300Duration: 30d 10h 15mSampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

The clock information on this data file was extensively edited by Dr. H. Perkins for his thesis. The data presented here have had bad data values removed but not the Perkins time adjustment. Time difference is less than two hours.

Compass assembly leaked causing problems with the compass values. Vane follower sticks February 20, 1969. The quality of this data file is very poor.

STATS

DATA/ 2896E900

	EAST	NORTH	SPEED	EAST & NORTH	
MEAN	-6.68	-17.48	26.59		-8.92
STD. ERR.	.30	.28	.21		7.28
VARIANCE	255.59	232.68	131.32		394.24
STD. DEV.	15.99	15.25	11.46		19.37
KURTOSIS	3.17	3.01	3.64		18.71
SKEWNESS	-.01	-.08	1.22		244.13
					15.62

UNITS OF RAW DATA VARIABLES = MM/SEC

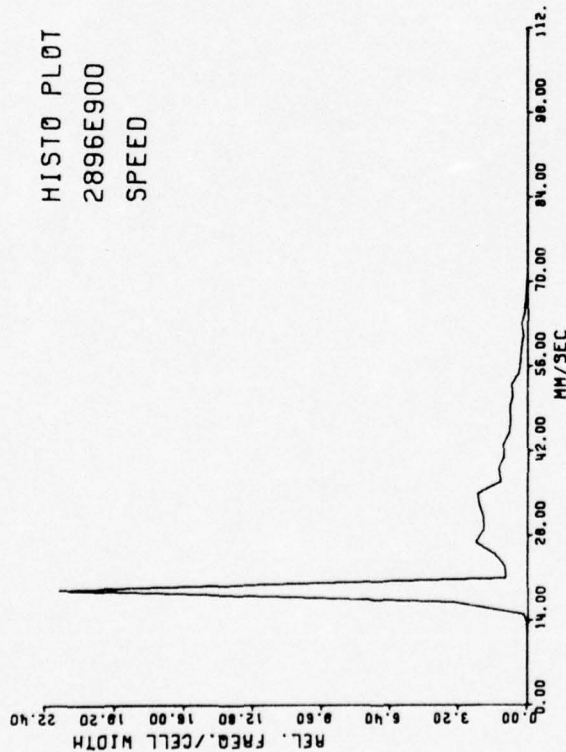
SAMPLE SIZE = 2922 POINTS

SPANNING RANGE

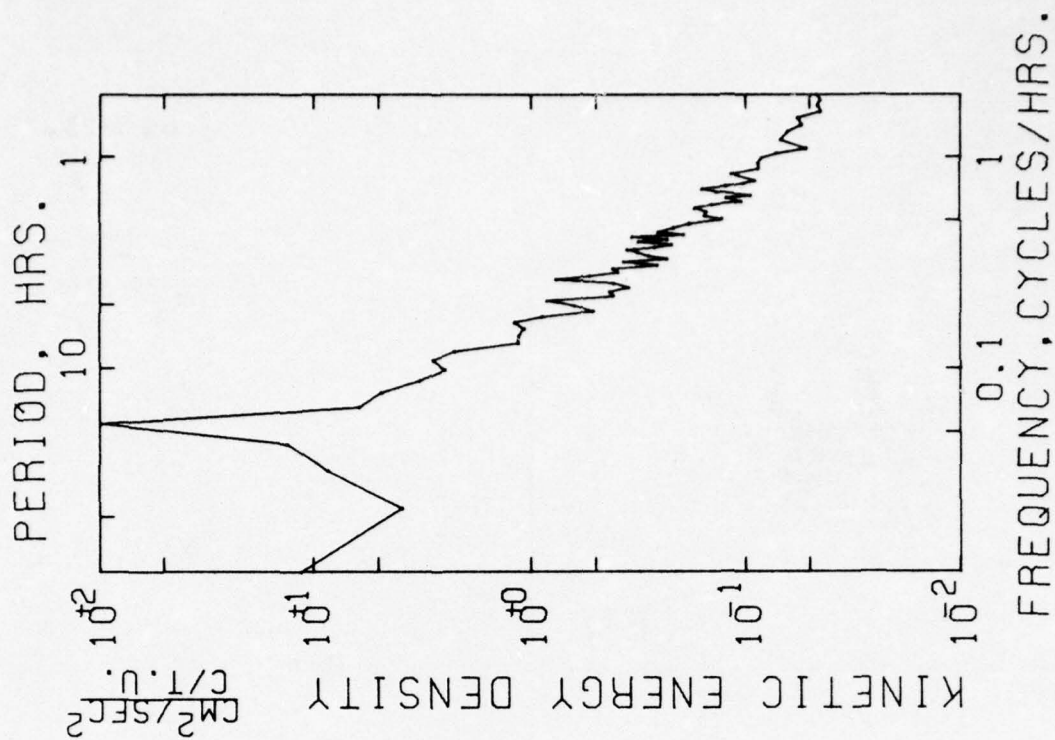
FROM 89- I -22 22.48.00

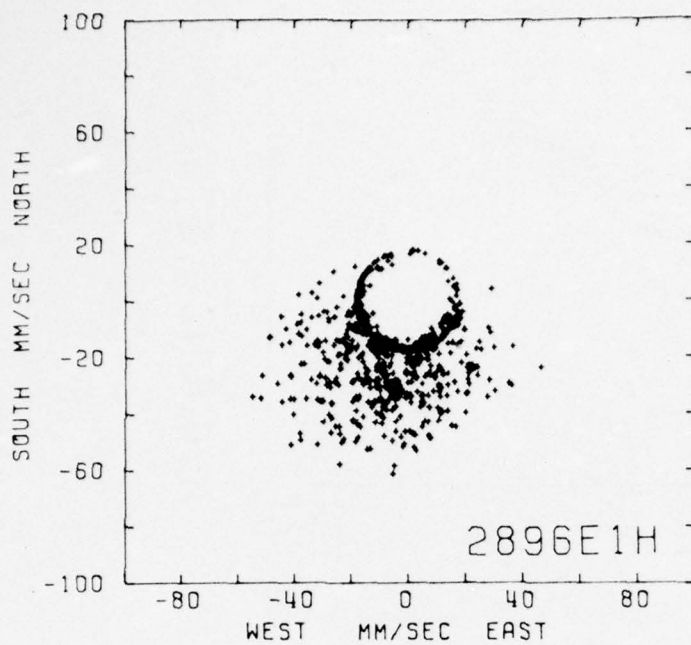
TO 89- II -22 09.03.00

DURATION 30 DAYS 10 H 15 M 0 S



AUTO SPECTRUM
2896E900 EAST COMP
2896E900 NORTH COMP
2219 METERS
69-I-22 TO 69-II-22
1 PIECES WITH 1458 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



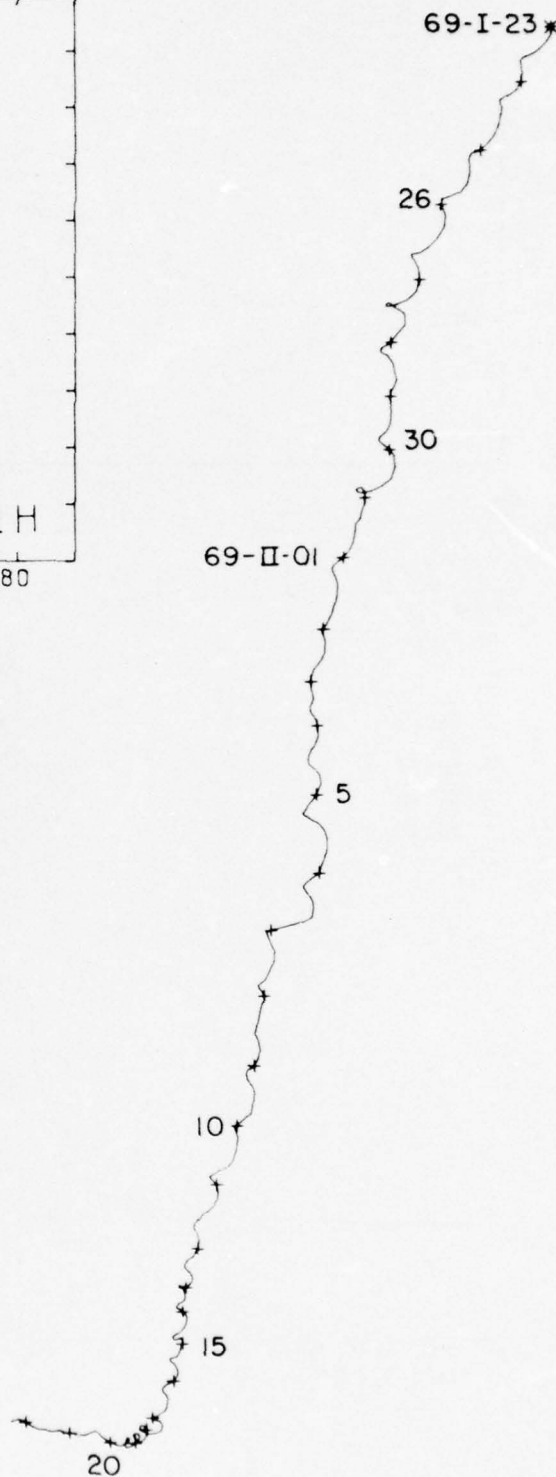


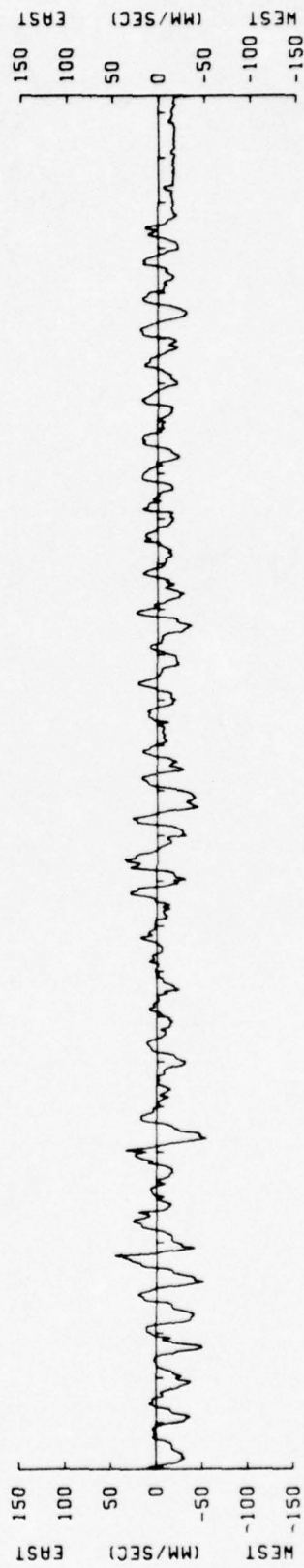
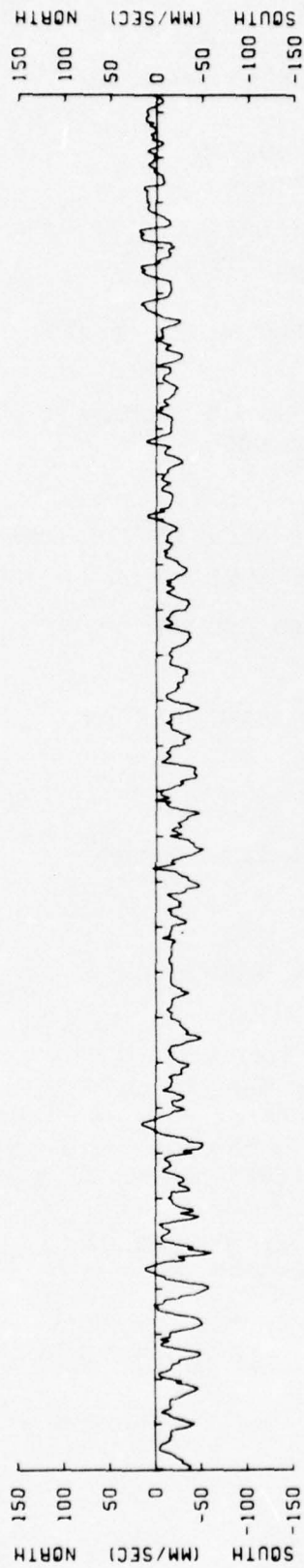
0. 10.
KILOMETERS

2896E1H

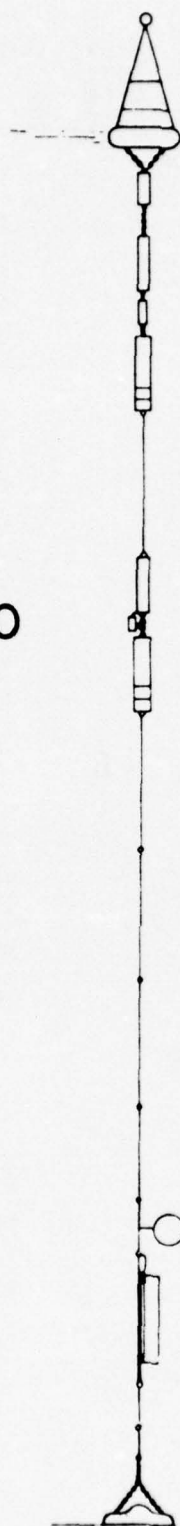
2219 M

69- I -23 TO 69- II -22





STATION 290



LIGHT
RADIO
WIND RECORDER - 2901

TENSIO METER
3 m CHAIN

VIB / TENS RECORDER - 2902

SWIVEL

CURRENT METER - 2903

500 m 1 x 19 BERGEN
GAC, USED

VIB / TENS RECORDER - 2904
ACCELEROMETER ON 1 m CHAIN

CURRENT METER - 2905

500 m SAME BERGEN

500 m SAME BERGEN

500 m 9/16" NYLON

365 m 9/16" NYLON

85 m 5/8" NYLON WITH 28 GLASS
SPHERES SPACED 20 m APART

AMF ACOUSTIC RELEASE,
TRANSPONDING

35 m 3/4" NYLON

15 m 5/8" NYLON

4,800 LB STIMSON ANCHOR

Mooring No. 290

Set 69 Apr 16 39° 10.9N 70° 02.5W
Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R. V. Chain Cruise 90

Retrieved 69 Apr 24
Year Month Day

Retrieved by R. Heinmiller Ship R. V. Chain Cruise 90

Purpose of Mooring: 1) Launch transient and mooring dynamics measurements.
2) Part of acoustic net with 291 and 293.

Mooring Type: Surface

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2901	W-101X	M.W.R.	-0-	
2902	Ser. 2	Vib/Ten	10	
2903*	M-151	M.C.M.	16	
2904	Ser. 1	Vib/Ten	518	
2905*	M-198	M.C.M.	521	Rotor out of its bearings at recovery

Water Depth 2682

Hydrographic Stations

R. V. Chain cruise 90 Station 872

R. V. Chain cruise 90 Station 873

R. V. Chain cruise 90 Station 878

COMMENTS ON MOORING:

Canadian vessel "Jean Frances" reported fouling her longlines in mooring on April 23, 1969.

Data number 2903

Instrument No.: M-151

Type: Magnetic tape current meter

Depth: 16 m

Water depth: 2682 m

Start time: 69-IV-16 115712

Stop time: 69-IV-24 160712

Duration: 8d 4h 10m

Sampling scheme: Continuous

one reading every 5 seconds

COMMENTS:

STATS

DATA/ 2903A300

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN	= 442.02	197.92	520.40	=	COVARIANCE	= 30409.34
STD. ERR.	= 5.52	4.27	5.77	=	STD. ERR. OF COVARIANCE	= 2880.65
VARIANCE	= 71802.46	42852.15	78483.55	=	STD. DEV. OF COVARIANCE	= 139783.17
STD. DEV.	= 267.86	207.25	280.17	=	CORRELATION COEFFICIENT	= .548
KURTOSIS	= 2.09	3.13	1.95	=	VECTOR MEAN	= 484.31
SKEWNESS	= -.12	.57	.10	=	VECTOR VARIANCE	= 57377.90
				=	STD. DEV.	= 239.54

UNITS OF RAW DATA VARIABLES = MM/SEC

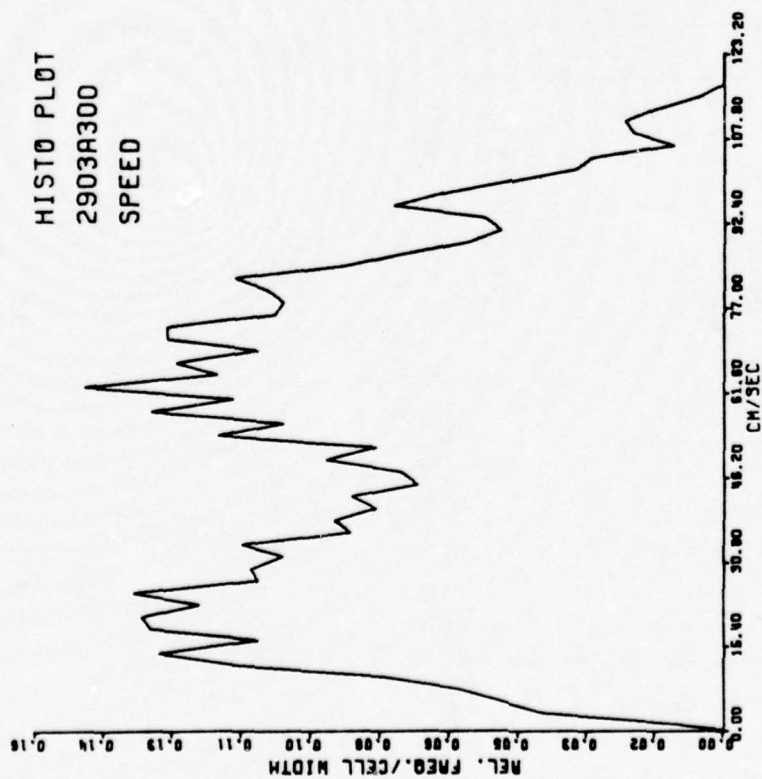
SAMPLE SIZE = 2355 POINTS

SPANNING RANGE

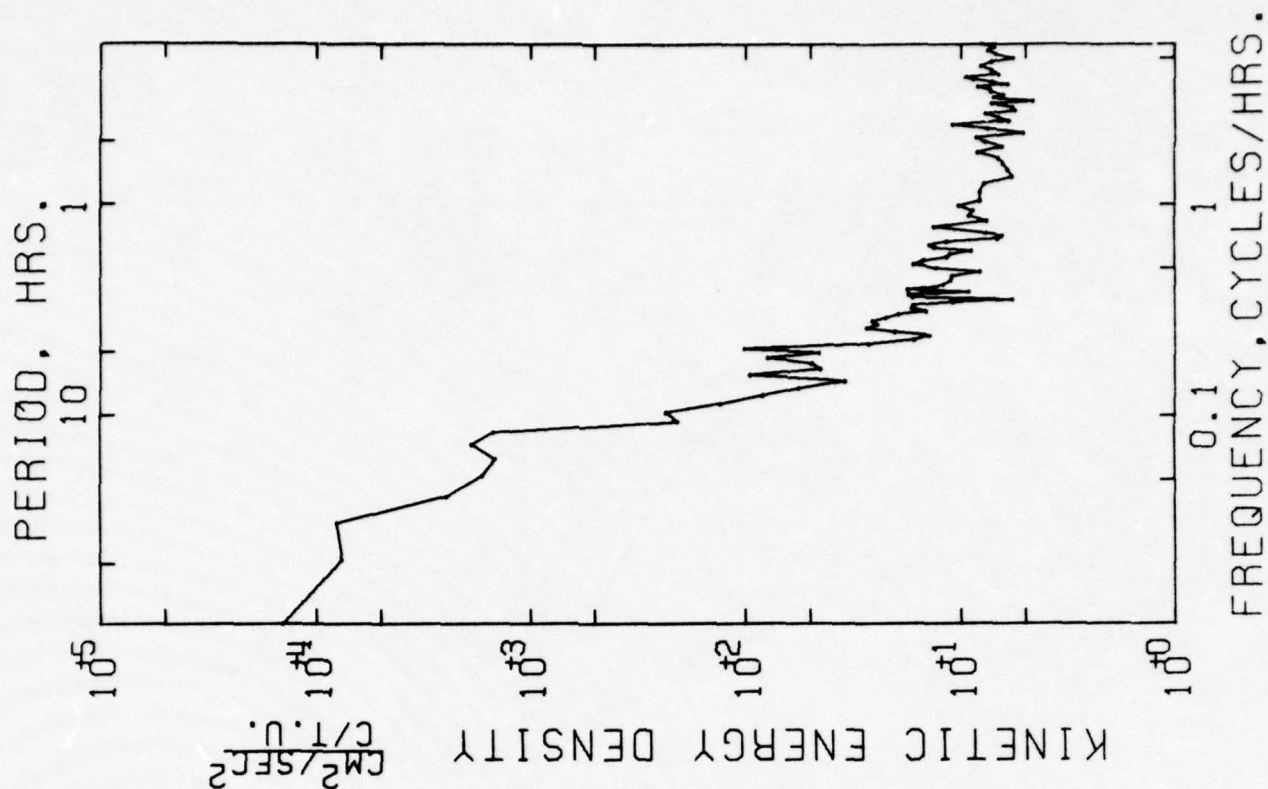
FROM 69- IV -16 11.57.12

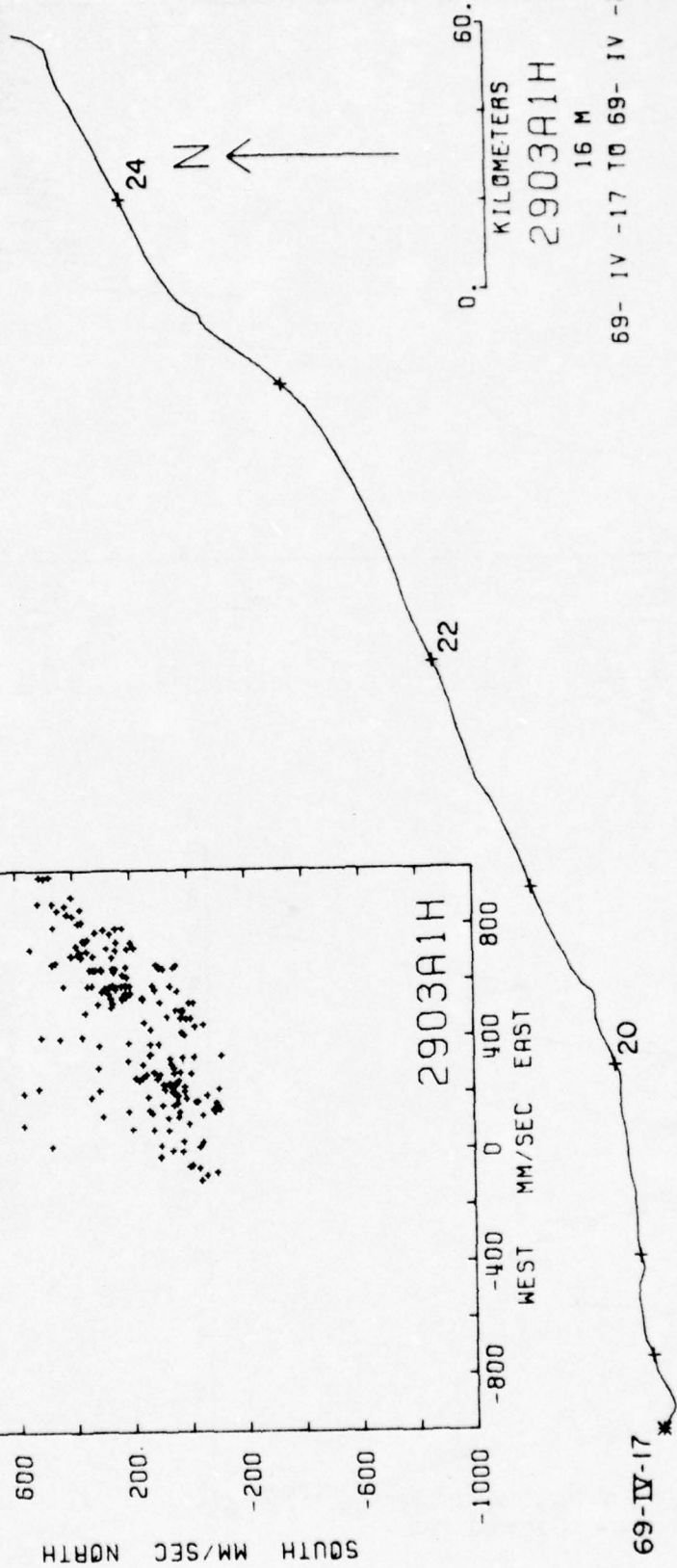
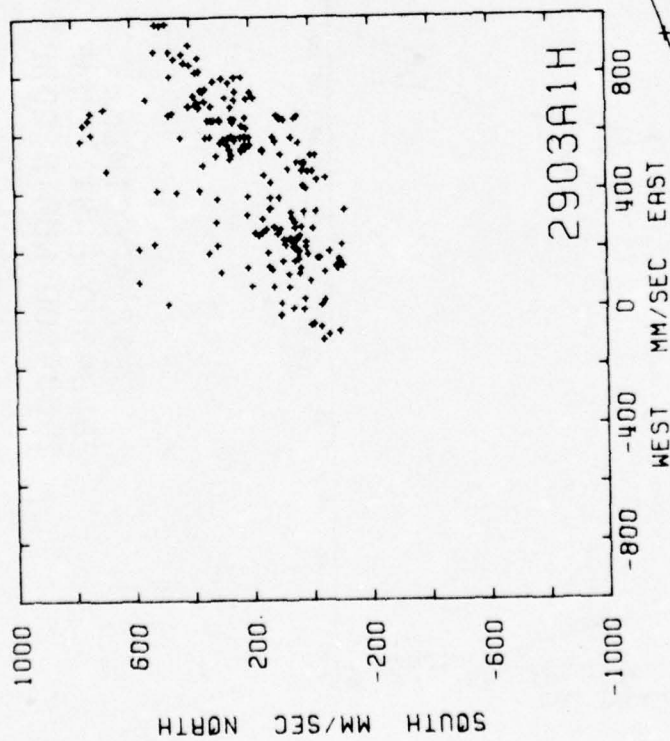
TO 69- IV -24 16.07.12

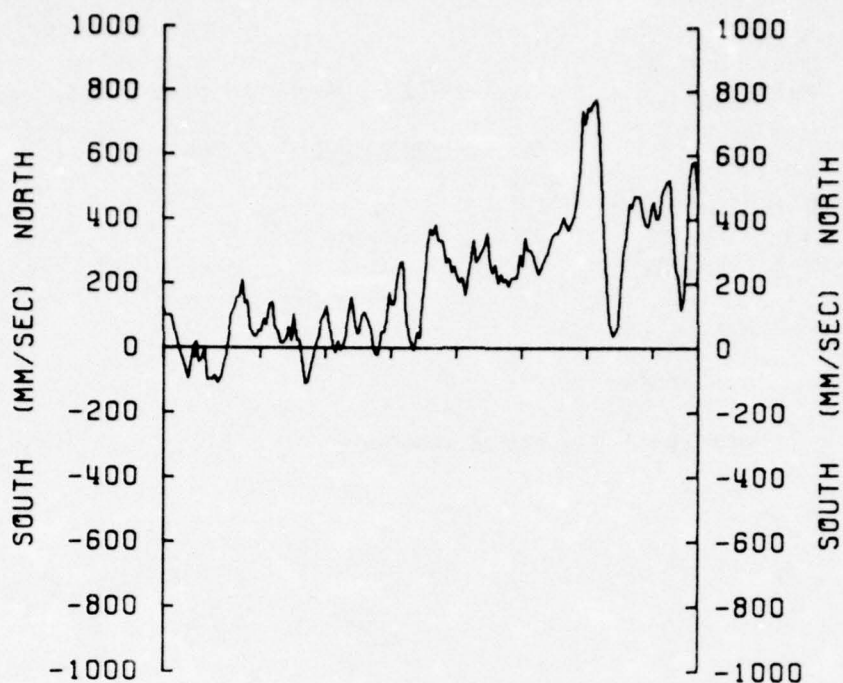
DURATION 8 DAYS 4 H 10 M 0 S



AUTO SPECTRUM
2903A300 EAST COMP
2903A300 NORTH COMP
16 METERS
69-IV-16 TO 69-IV-24
1 PIECES WITH 1152 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



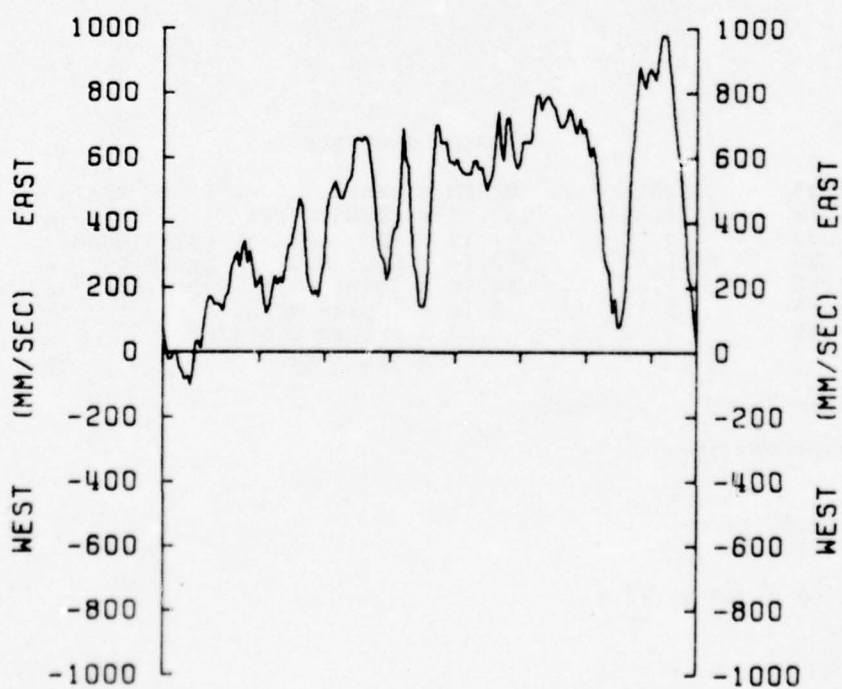




2903A1H

16 M

17 APR 69 22



Data number 2905

Instrument No.: M-198

Type: Magnetic tape current meter

Depth: 521 m

Water depth: 2682 m

Start time: 69-IV-16 130022

Stop time: 69-IV-24 154022

Duration: 8d 2h 40m

Sampling scheme: Continuous

one reading every 5 seconds

COMMENTS:

STATS

DATA/ 2905\$300

	EAST	NORTH
MEAN	= 80.99	73.94
STD. ERR.	= .86	1.48
VARIANCE	= 2132.49	5119.27
STD. DEV.	= 46.18	71.55
KURTOSIS	= 2.93	3.30
SKEWNESS	= .05	-.02

SPEED	=	*****	EAST & NORTH	*****
127.71	=	COVARIANCE	=	321.89
1.13	=	STD. ERR. OF COVARIANCE	=	161.18
2869.19	=	STD. DEV. OF COVARIANCE	=	7792.22
54.48	=	CORRELATION COEFFICIENT	=	.097
2.78	=	VECTOR MEAN	=	109.66
.53	=	VECTOR VARIANCE	=	3625.88
	=	STD. DEV.	=	60.22

UNITS OF RAW DATA VARIABLES = MM/SEC

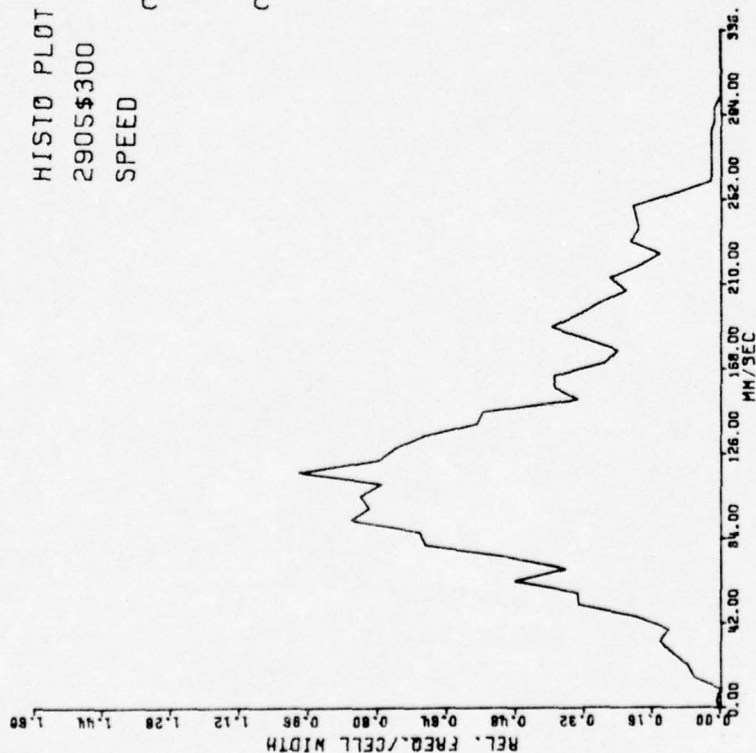
SAMPLE SIZE = 2337 POINTS

SPANNING RANGE

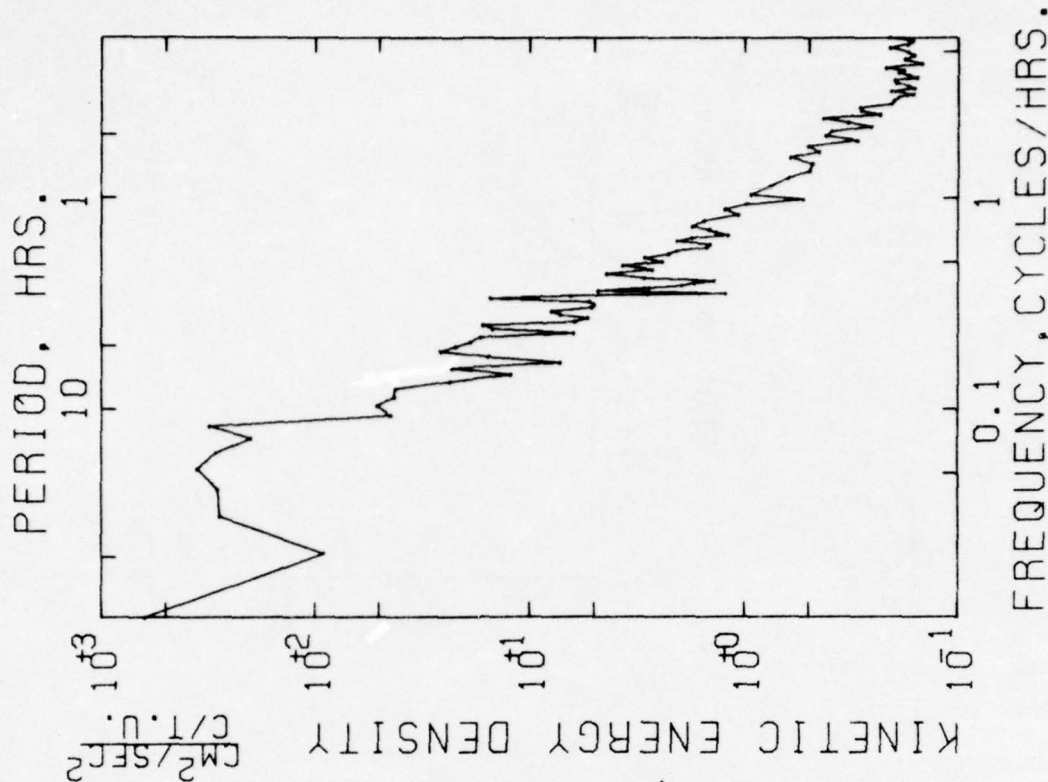
FROM 69- IV -16 13.00.22
TO 69- IV -24 15.40.22

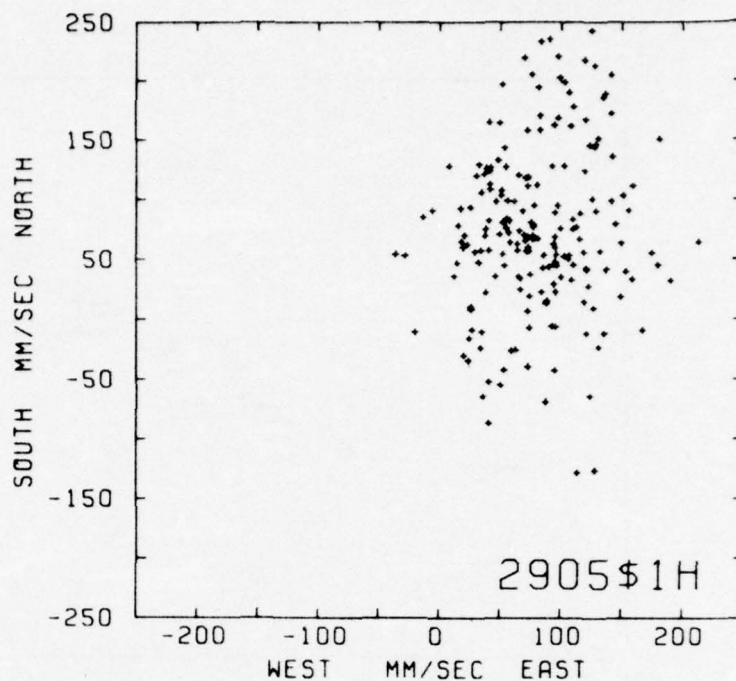
DURATION 8 DAYS 2 H 40 M 0 S

HISTO PLOT
2905\$300
SPEED



AUTO SPECTRUM
2905\$300 EAST COMP
2905\$300 NORTH COMP
521 METERS
69-IV-16 TO 69-IV-24
1 PIECES WITH 1152 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



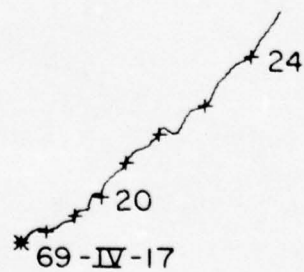


0. 60.
KILOMETERS

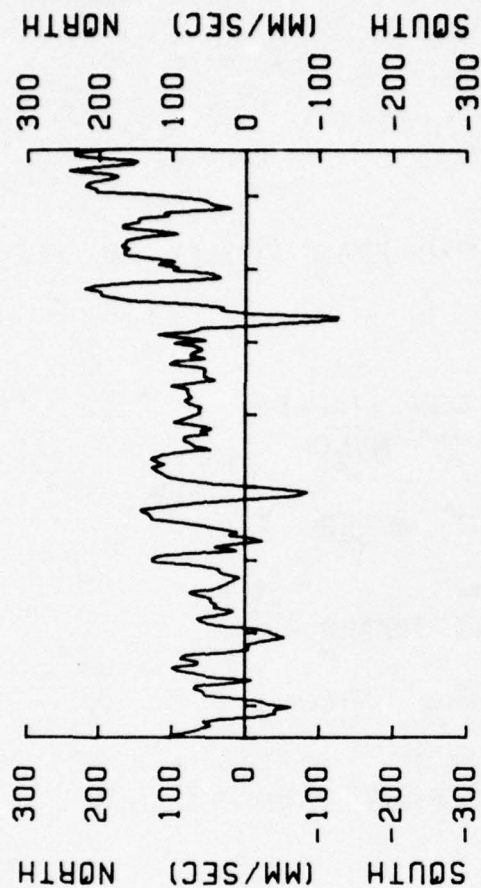
2905\$1H

521 M

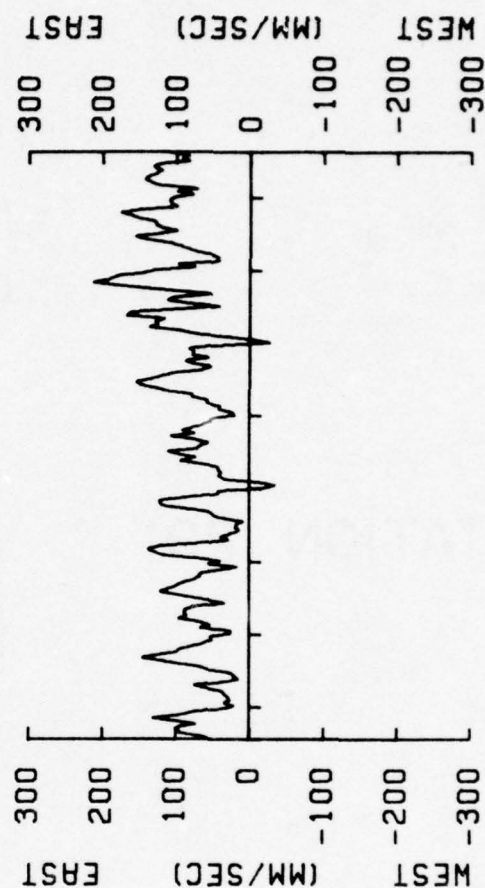
69- IV -17 TO 69- IV -24



2905\$1H
521 M



17
APR
69
22



SYNTACTIC FOAM FLOAT

CURRENT METER - 2911

CURRENT METER - 29/2

AMF RELEASE, TRANSPONDING

2 m CHAIN

800 LB. STIMSON ANCHOR

Mooring No. 291

Set 69 Apr 16 39° 08.7N 70° 02.5W
 Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R. V. Chain Cruise 90

Retrieved 69 Apr 24
 Year Month Day

Retrieved by R. Heinmiller Ship R. V. Chain Cruise 90

Purpose of Mooring: 1) Test of new syntactic foam float. 2) Part of acoustic net with 290 and 293. 3) Investigation of sampling intervals on deep stations
 Mooring Type: Subsurface.

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2911*	M-209	M.C.M.	2581	
2912	M-211	M.C.M.	2583	Electrical problems with rotor

Water depth 2682

Hydrographic Stations

R. V. Chain cruise 90 Station 872
 R. V. Chain cruise 90 Station 873
 R. V. Chain cruise 90 Station 878

COMMENTS ON MOORING:

Data number 2911

Instrument No.: M-209

Type: Magnetic tape current meter

Depth: 2581 m

Water depth: 2682 m

Start time: 69-IV-16 165533

Stop time: 69-IV-24 144033

Duration: 7d 21h 45m

Sampling scheme: Continuous

one reading every 5 seconds

COMMENTS:

STATS

	EAST	NORTH
MEAN	-39.18	29.24
STD. ERR.	1.18	.86
VARIANCE	1063.64	561.75
STD. DEV.	32.61	23.70
KURTOSIS	2.16	2.78
SKEWNESS	-.33	-.47

DATA/ 29110900

SPEED	*****	EAST & NORTH	*****
57.82	=	COVARIANCE	= -25.96
.94	=	STD. ERR. OF COVARIANCE	= 54.56
672.23	=	STD. DEV. OF COVARIANCE	= 1504.23
25.93	=	CORRELATION COEFFICIENT	= -.034
2.51	=	VECTOR MEAN	= 48.89
.40	=	VECTOR VARIANCE	= 812.70
	=	STD. DEV.	= 28.51

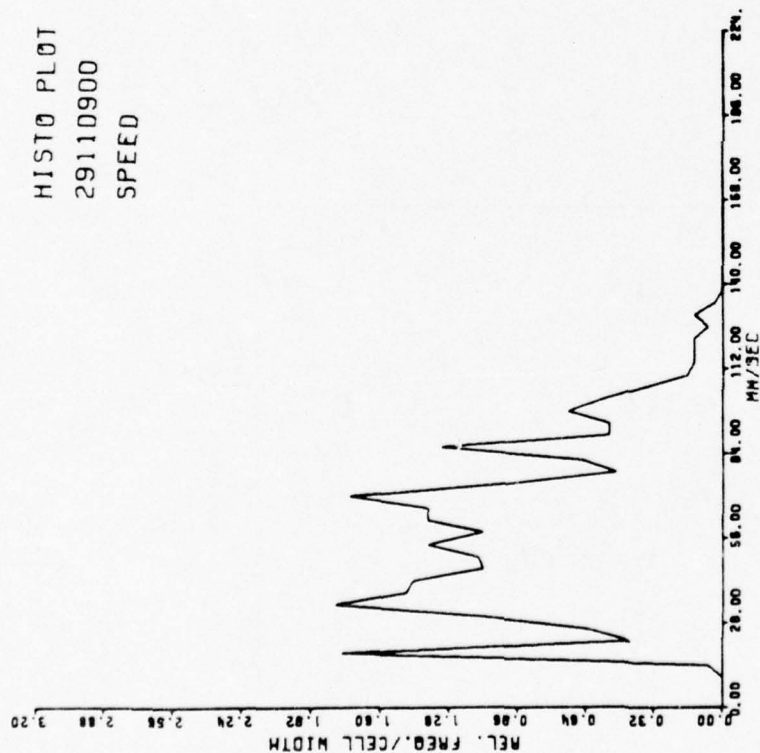
UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 760 POINTS

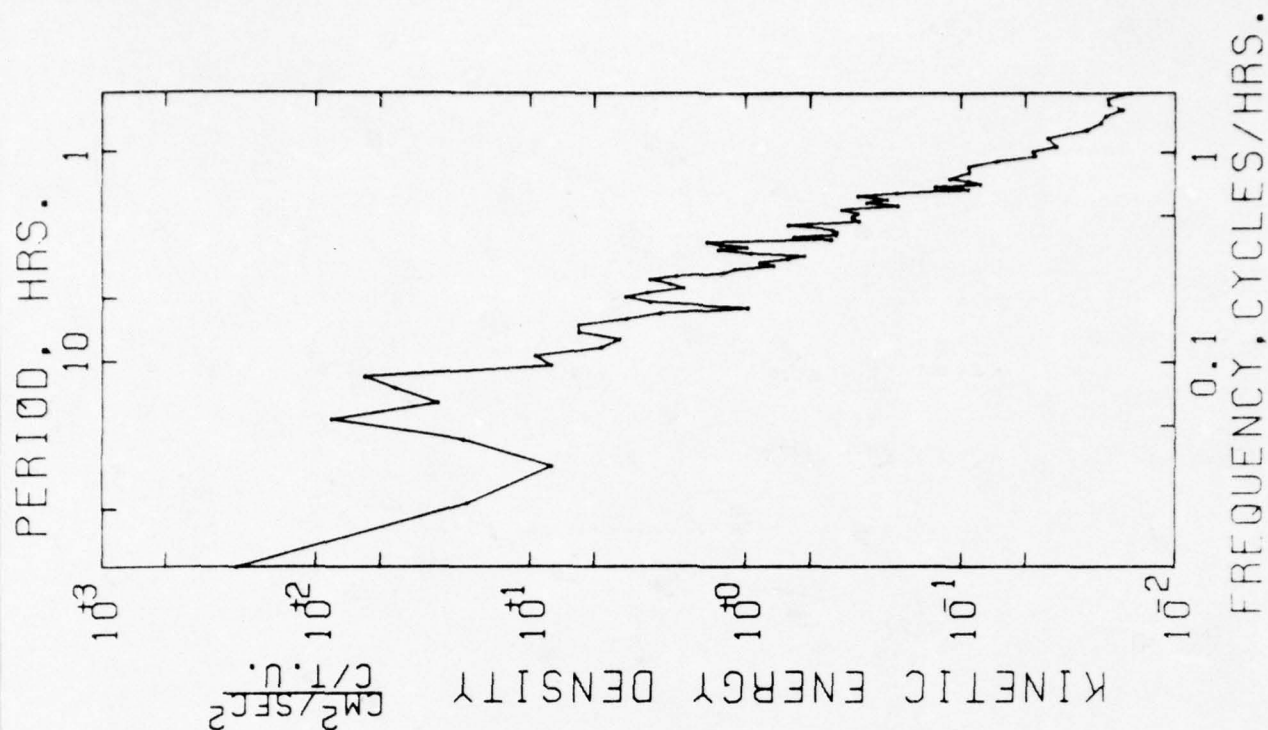
SPANNING RANGE

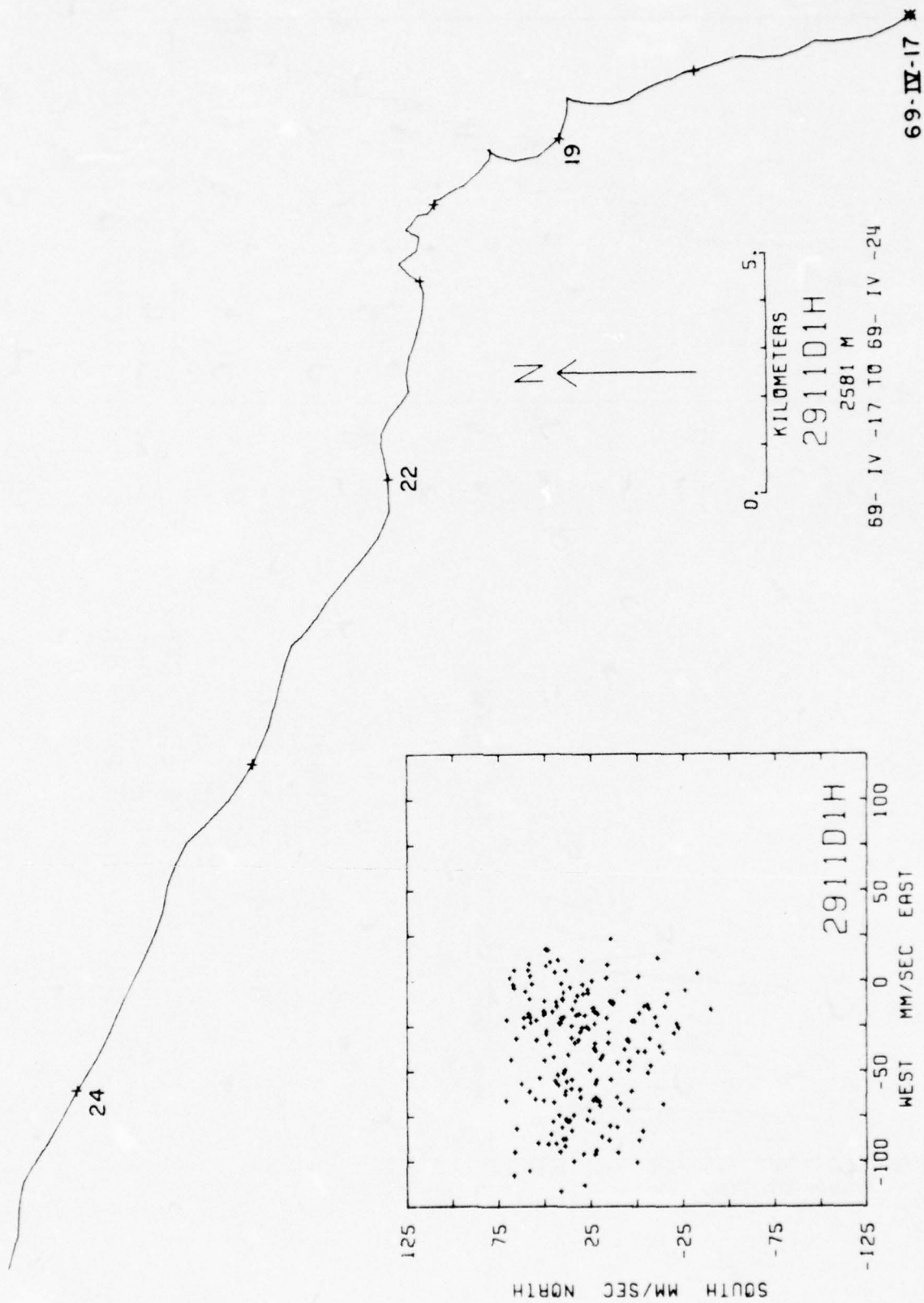
FROM 69- IV -16 16.55.33
TO 69- IV -24 14.40.33

DURATION 7 DAYS 21 H 45 M 0 S

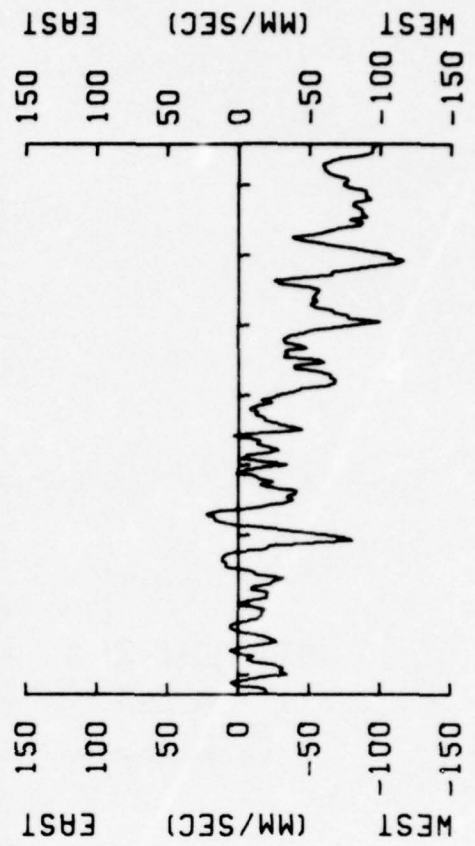


AUTO SPECTRUM
29110900 EAST COMP
29110900 NORTH COMP
2581 METERS
69-IV-16 TO 69-IV-24
1 PIECES WITH 375 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



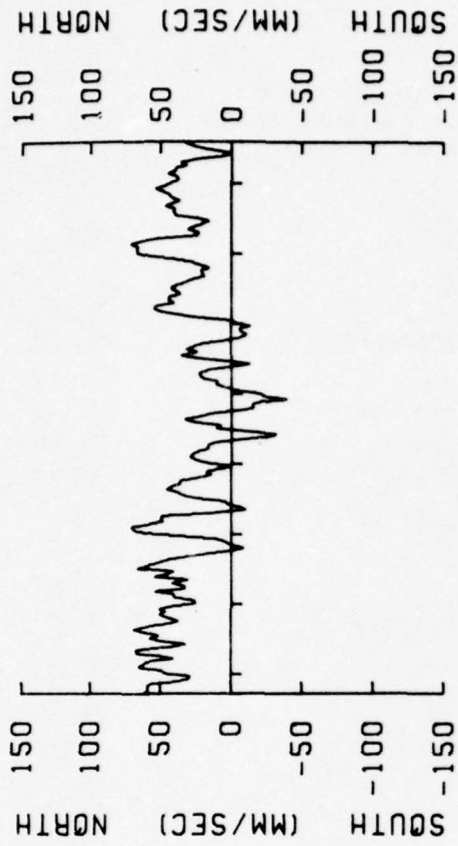


2911D1H
2581 M



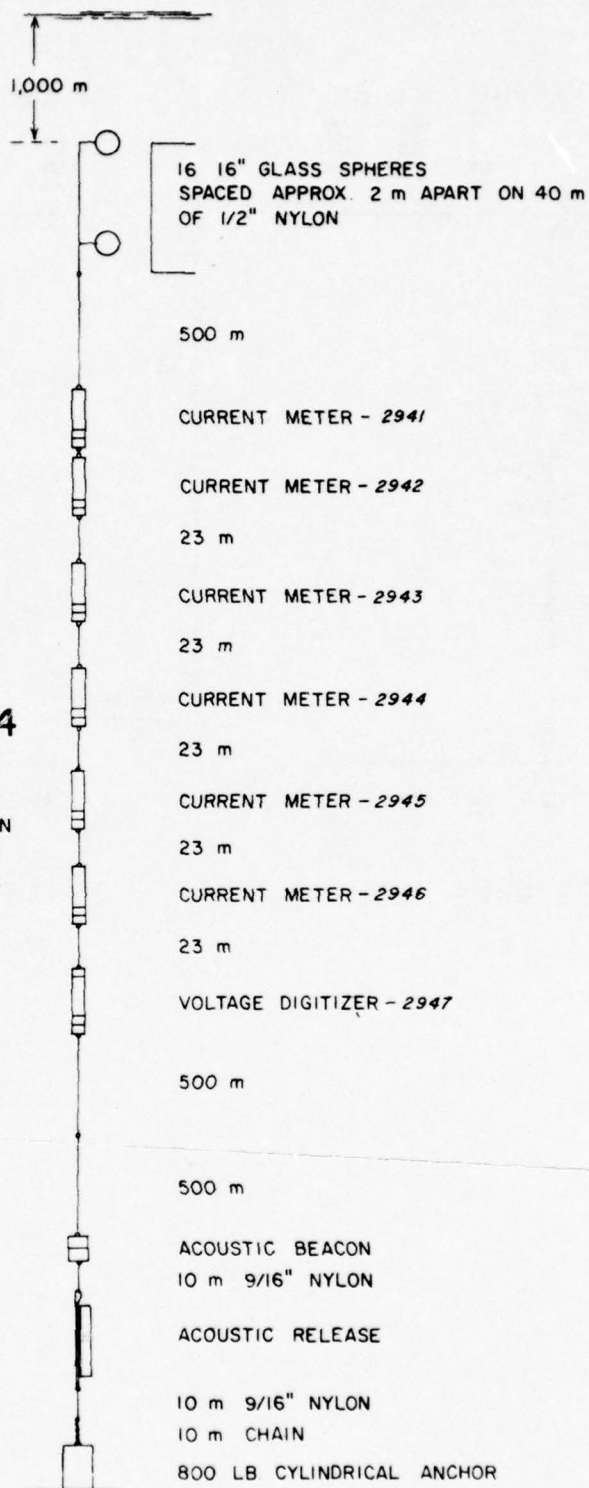
17
APR
69

22



STATION 294

ALL LINE ABOVE
BEACON
1/2" BRAIDED NYLON



Mooring No. 294

Set 69 Apr 17 39° 10.3N 70° 00.0W
 Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R. V. Chain Cruise 90

Retrieved 69 Apr 26
 Year Month Day

Retrieved by R. Heinmiller Ship R. V. Chain Cruise 90

Purpose of Mooring: 1) Shear measurements.
 2) Electromagnetic transport measurements.

Mooring Type: Subsurface

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2941*	M-142	M.C.M.	1512	
2942*	M-122	M.C.M.	1514	
2943	M-204	M.C.M.	1541	Bad CRT-1 board
2944*	M-159	M.C.M.	1564	
2945*	M-127	M.C.M.	1598	
2946*	M-170	M.C.M.	1614	
2947	N/A	Volt. Dig.	1641	No useable rotor, voltage data no good.

Water depth 2674

Hydrographic Stations

R. V. Chain cruise 90 Station 872

R. V. Chain cruise 90 Station 873

R. V. Chain cruise 90 Station 878

COMMENTS ON MOORING:

Mooring was set anchor first.

Data number 2941

Instrument No.: M-142

Type: Magnetic tape current meter

Depth: 1512 m

Water depth: 2674 m

Start time: 69-IV-17 223700

Stop time: 69-IV-26 110700

Duration: 8d 12h 30m

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 23

interval time = 900 seconds

COMMENTS:

STATS

DATA/ 29418900

MEAN	=	EAST	NORTH	SPEED	=	*****	EAST & NORTH	*****
STD. ERR.	=	-33.86	19.19	43.51	=	COVARIANCE	=	-44.51
VARIANCE	=	.59	.66	.57	=	STD. ERR. OF COVARIANCE	=	29.59
STD. DEV.	=	287.08	381.55	289.67	=	STD. DEV. OF COVARIANCE	=	846.93
KURTOSIS	=	16.94	19.01	18.42	=	CORRELATION COEFFICIENT	=	-.138
SKEWNESS	=	2.74	2.71	2.12	=	VECTOR MEAN	=	38.92
		.25	-.16	.19	=	VECTOR VARIANCE	=	324.31
					=	STD. DEV.	=	18.01

UNITS OF RAW DATA VARIABLES = MM/SEC

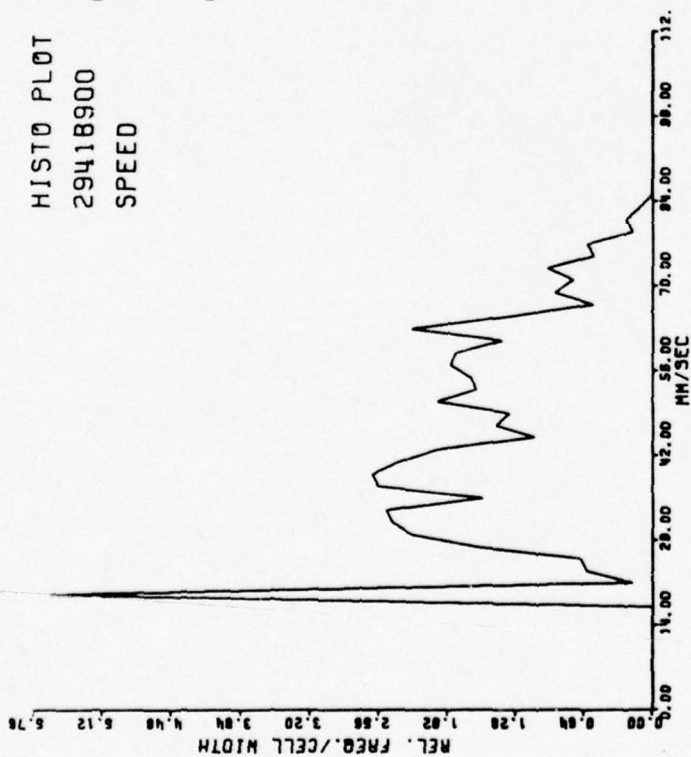
SAMPLE SIZE = 819 POINTS

SPANNING RANGE

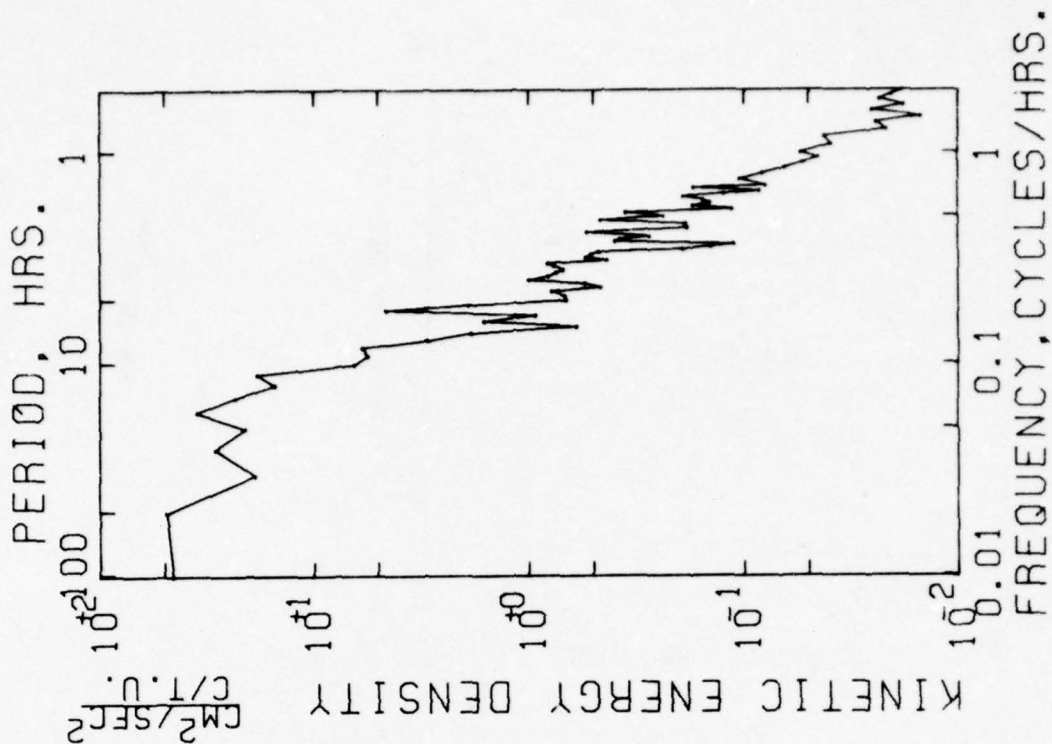
FROM 69- IV -17 22.37.00

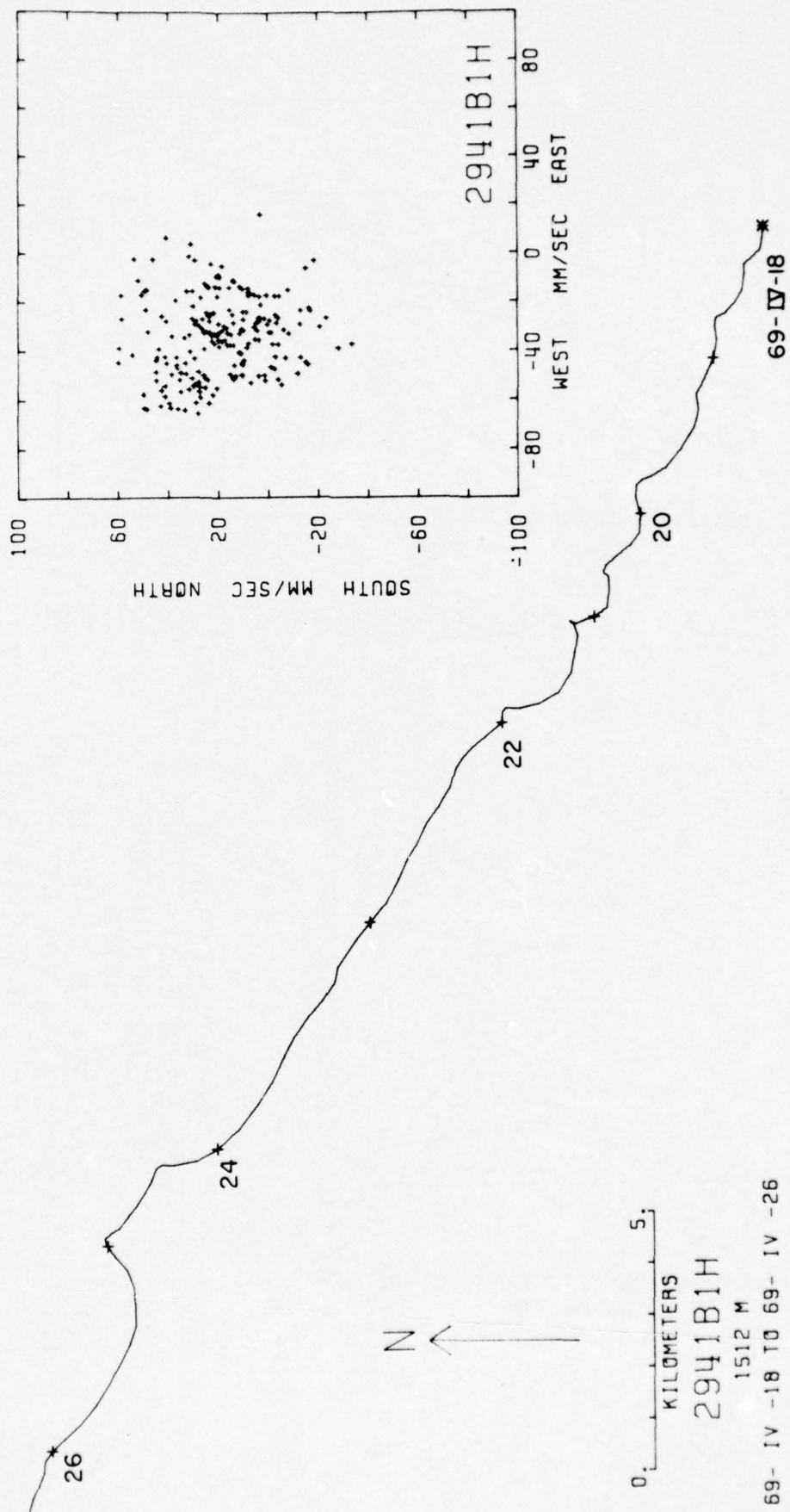
TO 69- IV -26 11.07.00

DURATION 8 DAYS 12 H 30 M 0 S

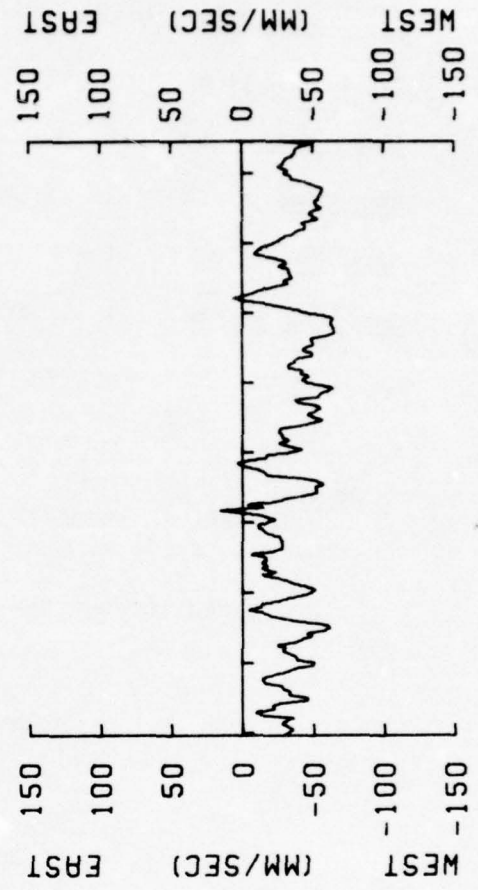
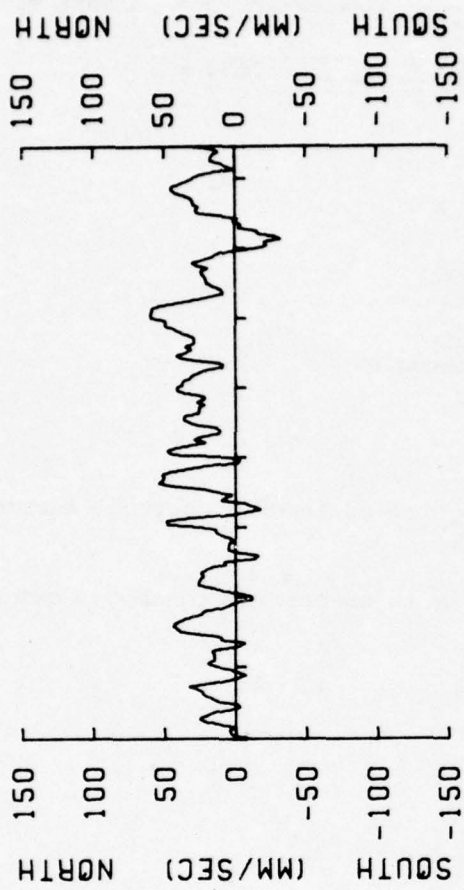


AUTO SPECTRUM
29418900 EAST COMP
29418900 NORTH COMP
1512 METERS
69-IV-17 TO 69-IV-26
1 PIECES WITH 405 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS





2941B1H
1512 M



Data number 2942

Instrument No.: M-122

Type: Magnetic tape current meter

Depth: 1514 m

Water depth: 2674 m

Start time: 69-IV-17 205002

Stop time: 69-IV-25 033002

Duration: 7d 6h 40m

Sampling scheme: Continuous

one reading every 5 seconds

COMMENTS:

Time base is suspect. There is an error of at least 3 hours 51 minutes in the 12 hour clock.

Processed through the SHEAR TIME program in an attempt to smooth out the time base.

STATS

DATA/ 2942G600

	EAST	NORTH
MEAN	-35.23	19.02
STD. ERR.	.55	.55
VARIANCE	322.83	318.08
STD. DEV.	17.87	17.78
KURTOSIS	2.82	2.44
SKEWNESS	-.19	-.08

SPEED	*****	EAST & NORTH	*****
41.89	=	COVARIANCE	= -85.85
.53	=	STD. ERR. OF COVARIANCE	= 29.24
285.43	=	STD. DEV. OF COVARIANCE	= 752.84
17.19	=	CORRELATION COEFFICIENT	= -.289
2.21	=	VECTOR MEAN	= 37.58
.95	=	VECTOR VARIANCE	= 319.48
	=	STD. DEV.	= 17.87

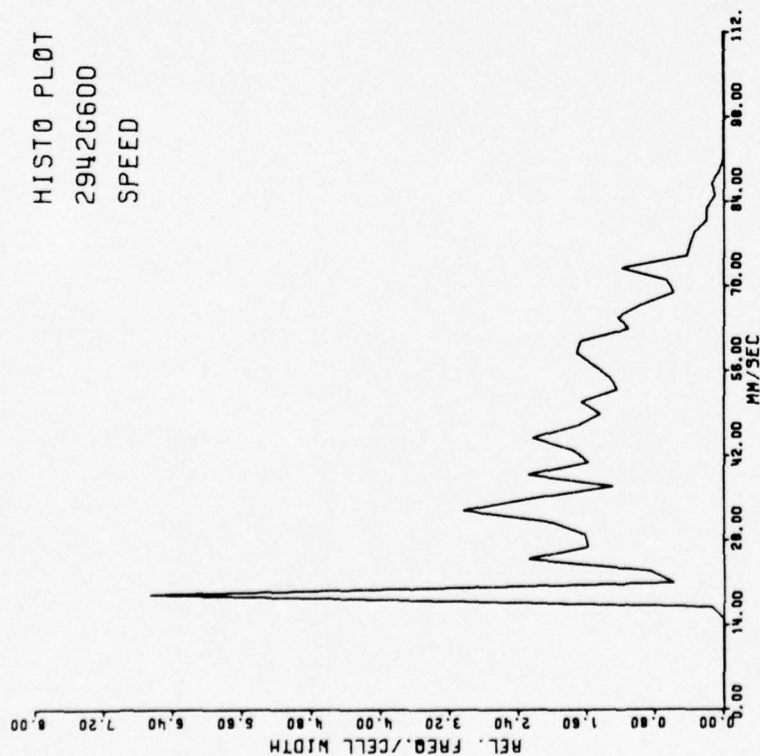
UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1049 POINTS

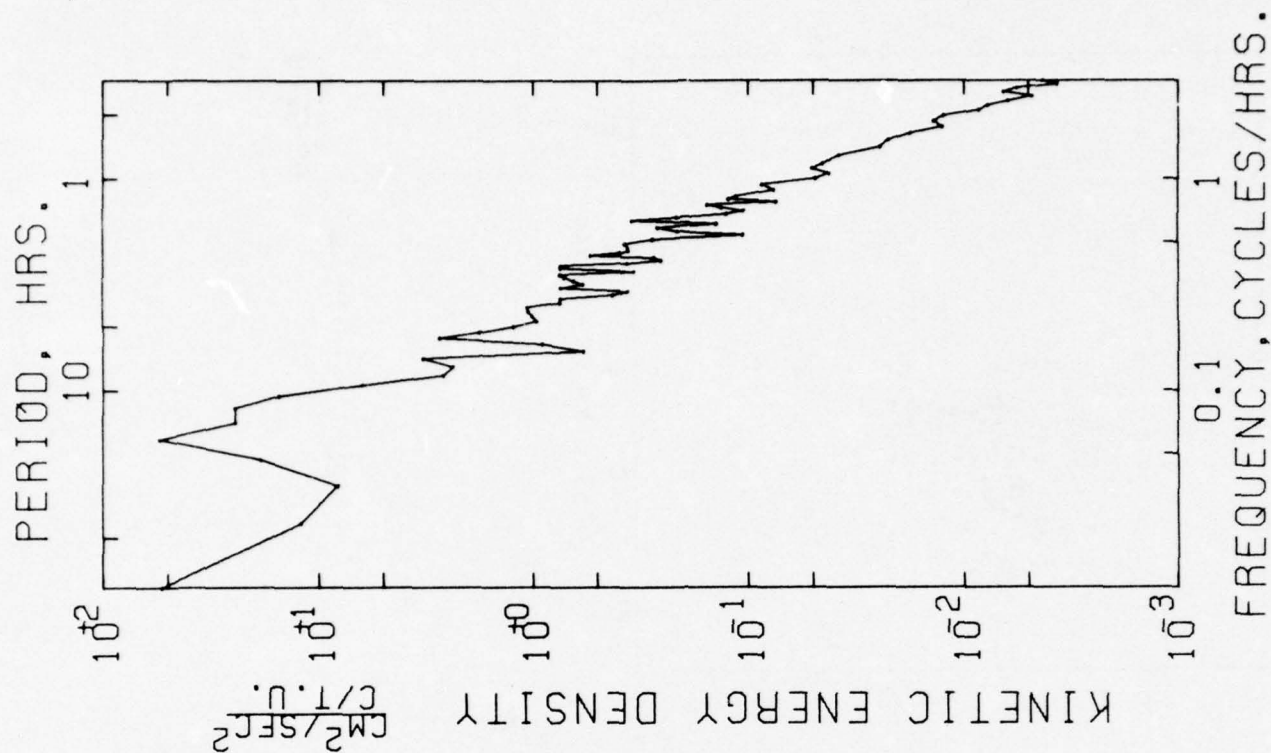
SPANNING RANGE

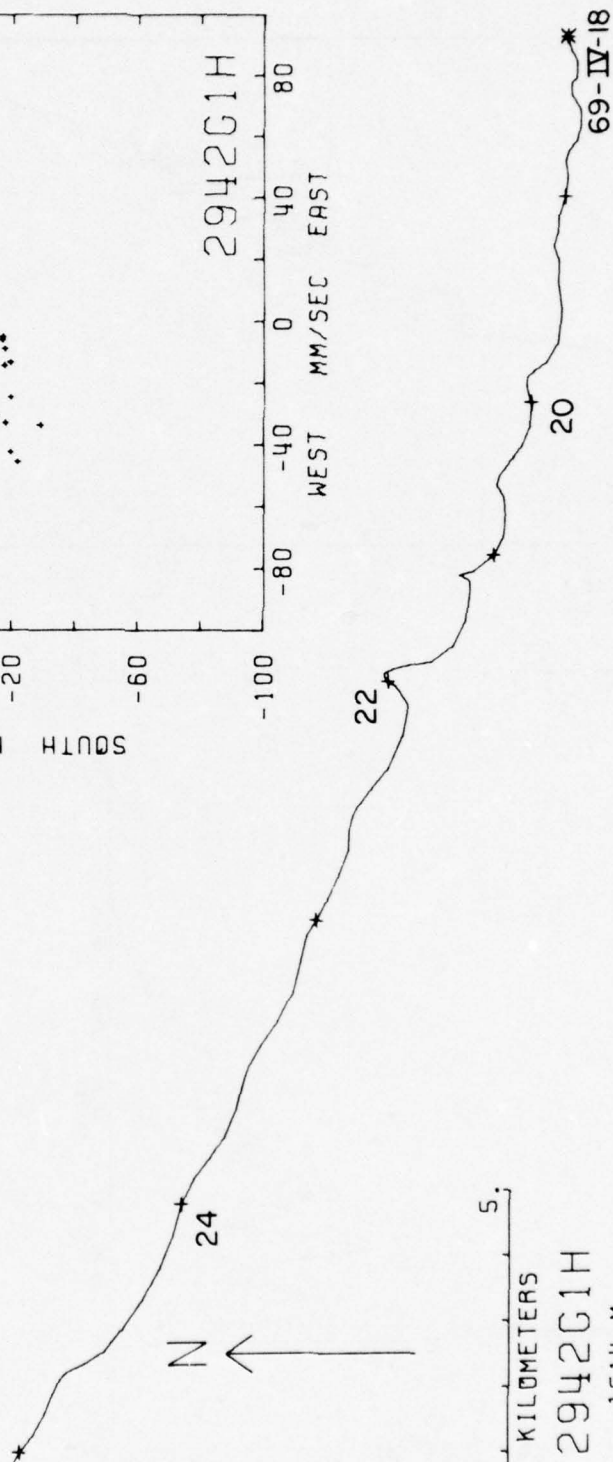
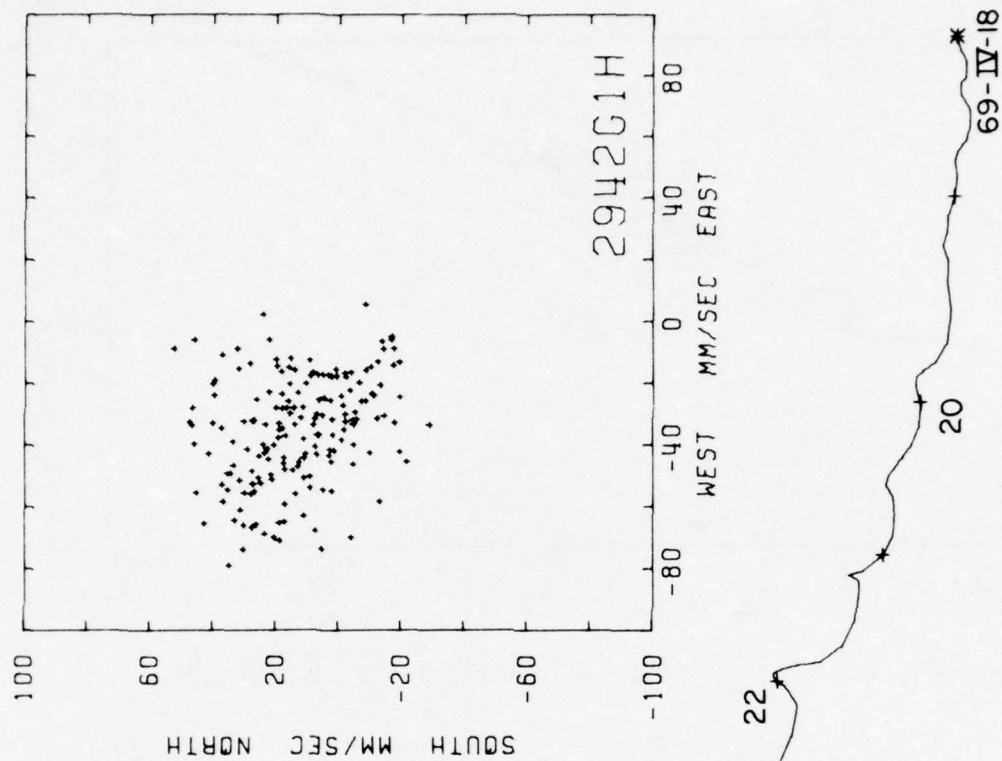
FROM 69- IV -17 20.50.02
TO 69- IV -25 03.30.02

DURATION 7 DAYS 6 H 40 M 0 S



AUTO SPECTRUM
2942G600 EAST COMP
2942G600 NORTH COMP
1514 METERS
69-IV-17 TO 69-IV-24
1 PIECES WITH 512 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS





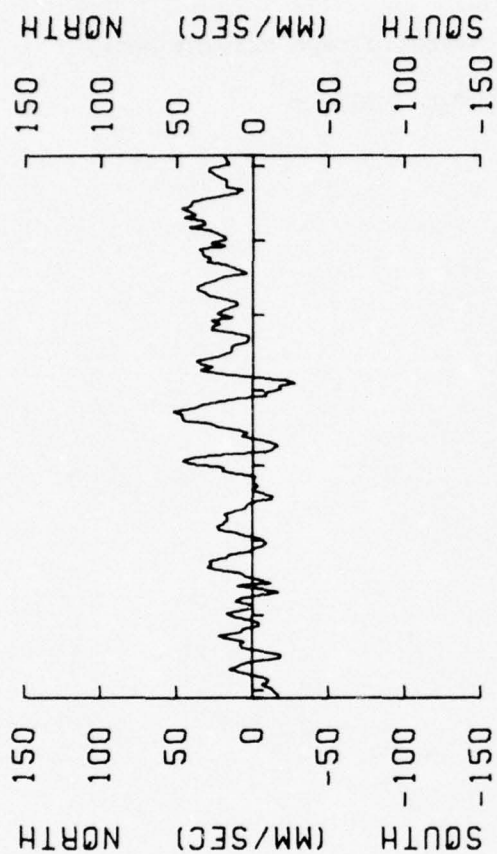
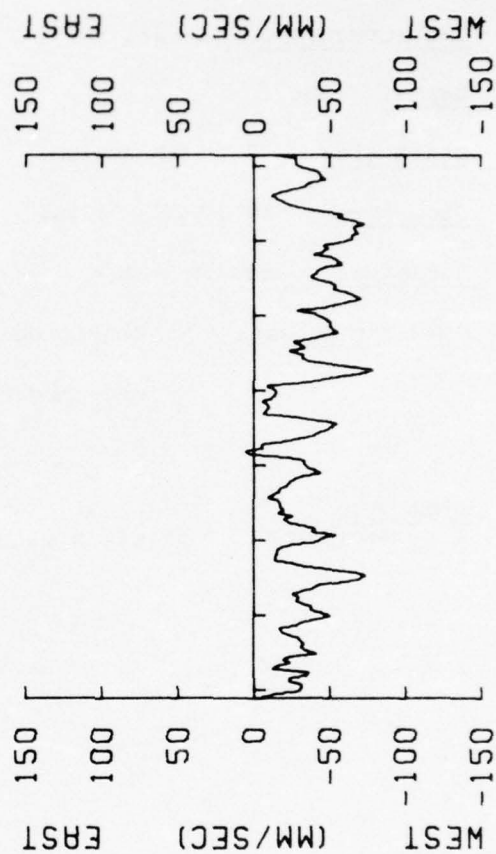
0. 5. KILOMETERS

2942G1H

1514 M

69- IV -18 TO 69- IV -25

2942G1H
1514 M



Data number 2944

Instrument No.: M-159

Type: Magnetic tape current meter

Depth: 1564 m

Water depth: 2674 m

Start time: 69-IV-17 205001

Stop time: 69-IV-26 043001

Duration: 8d 7h 40m

Sampling scheme: Continuous

one reading every 5 seconds

COMMENTS:

Mechanical clock was 4 minutes off.

STATS

DATA/ 2944\$600

MEAN	=	EAST	NORTH	SPEED	=	*****	EAST & NORTH	*****
STD. ERR.	=	-34.22	22.44	44.18	=	COVARIANCE	=	-121.47
VARIANCE	=	.57	.53	.61	=	STD. ERR. OF COVARIANCE	=	27.68
STD. DEV.	=	393.29	394.87	450.03	=	STD. DEV. OF COVARIANCE	=	858.85
KURTOSIS	=	19.83	18.30	21.21	=	CORRELATION COEFFICIENT	=	-.935
SKEWNESS	=	2.18	2.62	1.83	=	VECTOR MEAN	=	40.93
		-.36	.09	.25	=	VECTOR VARIANCE	=	984.08
					=	STD. DEV.	=	19.08

UNITS OF RAW DATA VARIABLES = MM/SEC

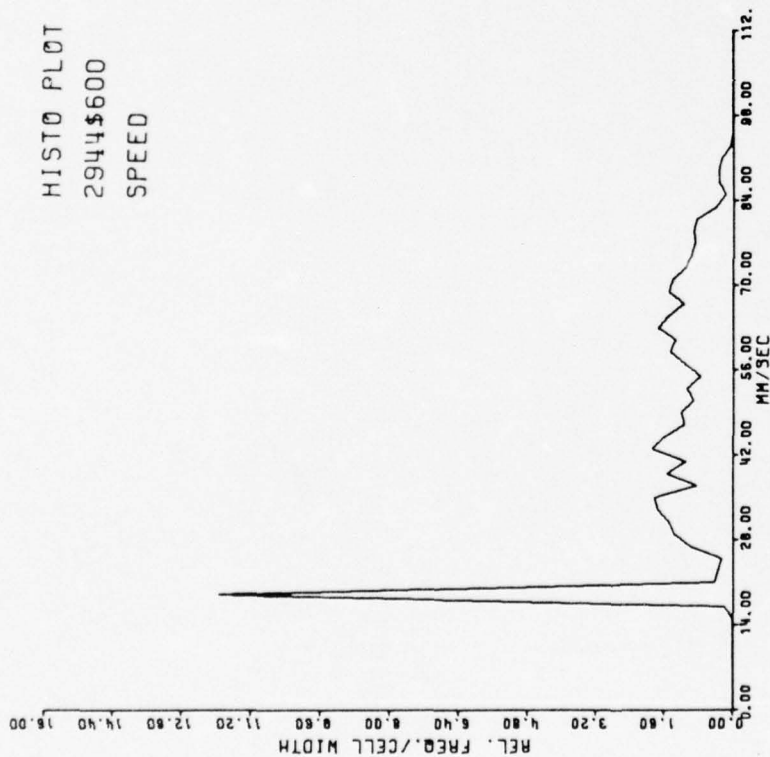
SAMPLE SIZE = 1199 POINTS

SPANNING RANGE

FROM 69- IV -17 20.50.01

TO 69- IV -26 04.30.01

DURATION 8 DAYS 7 H 40 M 0 S



AUTO SPECTRUM

2944\$600 EAST COMP

2944\$600 NORTH COMP

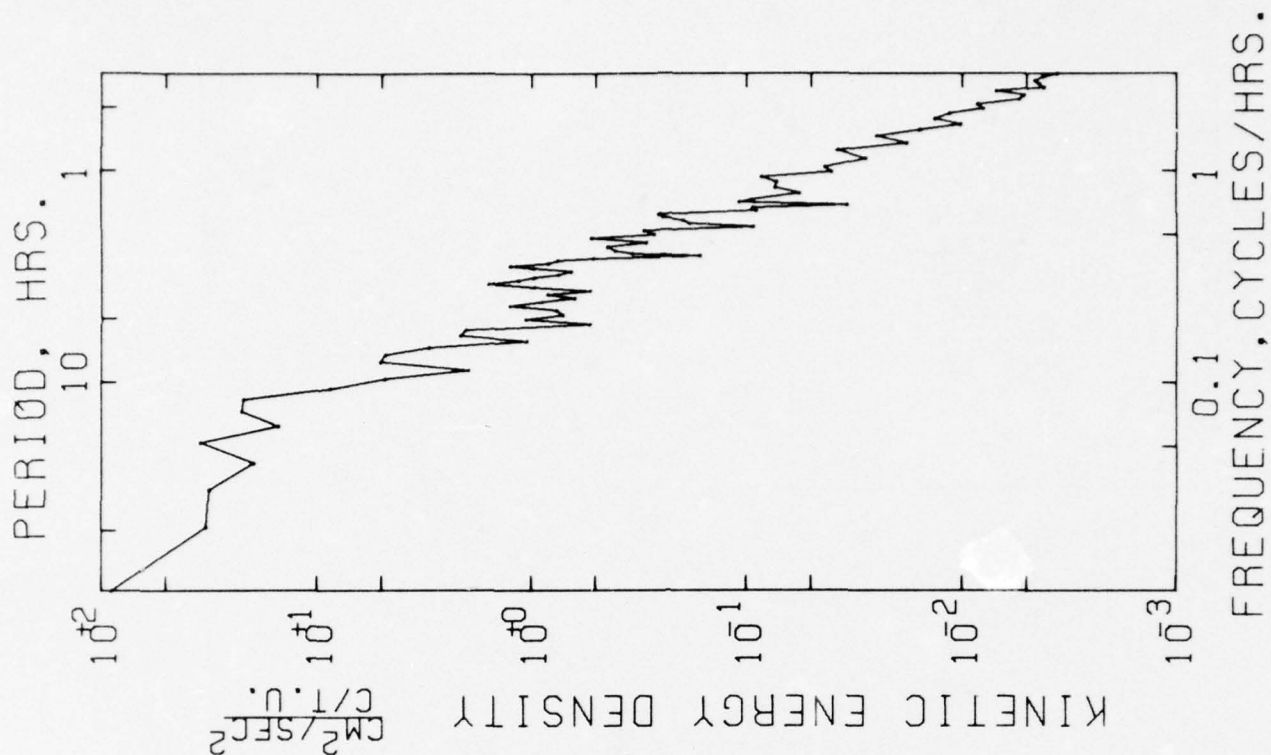
1564 METERS

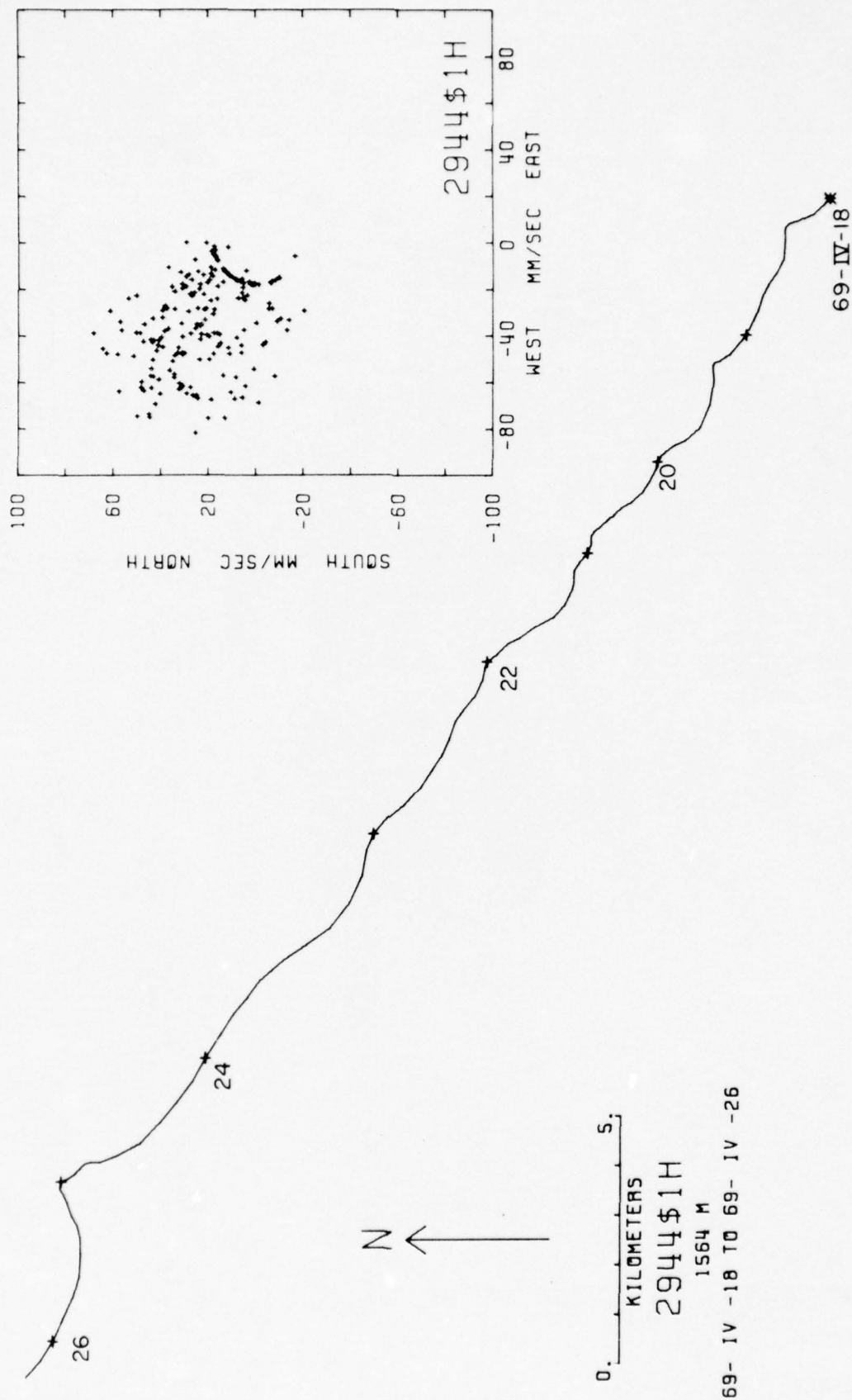
69-IV-17 TO 69-IV-25

1 PIECES WITH 576 ESTIMATES

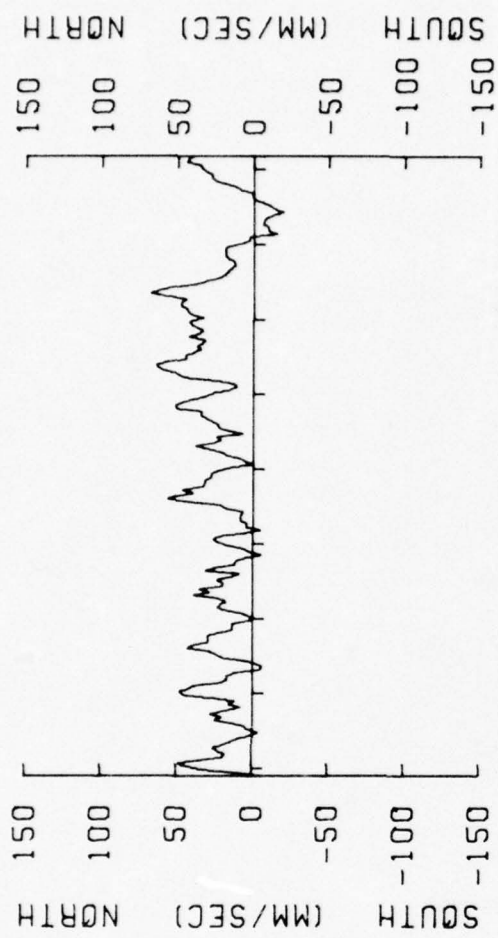
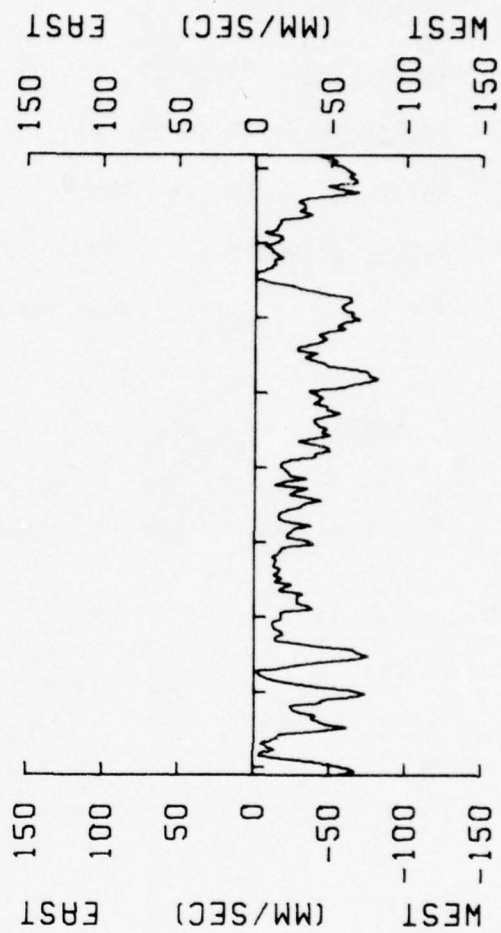
PER PIECE. AVERAGED OVER

2 ADJACENT FREQUENCY BANDS





2944\$1H
1564 M



Data number 2945

Instrument No.: M-127

Type: Magnetic tape current meter

Depth: 1598 m

Water depth: 2674 m

Start time: 69-IV-17 204206

Stop time: 69-IV-25 230706

Duration: 8d 2h 25m

Sampling scheme: Continuous

one reading every 5 seconds

COMMENTS:

Time base suspect last two days.

STATS

DATA/ 2945C300

MEAN	=	EAST	NORTH	SPEED	=	*****	EAST & NORTH	*****
STD. ERR.	=	-35.85	24.00	47.05	=	COVARIANCE	=	-151.57
VARIANCE	=	.44	.41	.46	=	STD. ERR. OF COVARIANCE	=	23.26
STD. DEV.	=	453.48	389.18	487.65	=	STD. DEV. OF COVARIANCE	=	1123.68
KURTOSIS	=	21.30	18.73	22.31	=	CORRELATION COEFFICIENT	=	-.361
SKEWNESS	=	2.83	2.72	2.45	=	VECTOR MEAN	=	43.23
	=	-.42	-.03	.43	=	VECTOR VARIANCE	=	421.33
					=	STD. DEV.	=	20.53

UNITS OF RAW DATA VARIABLES = MM/SEC

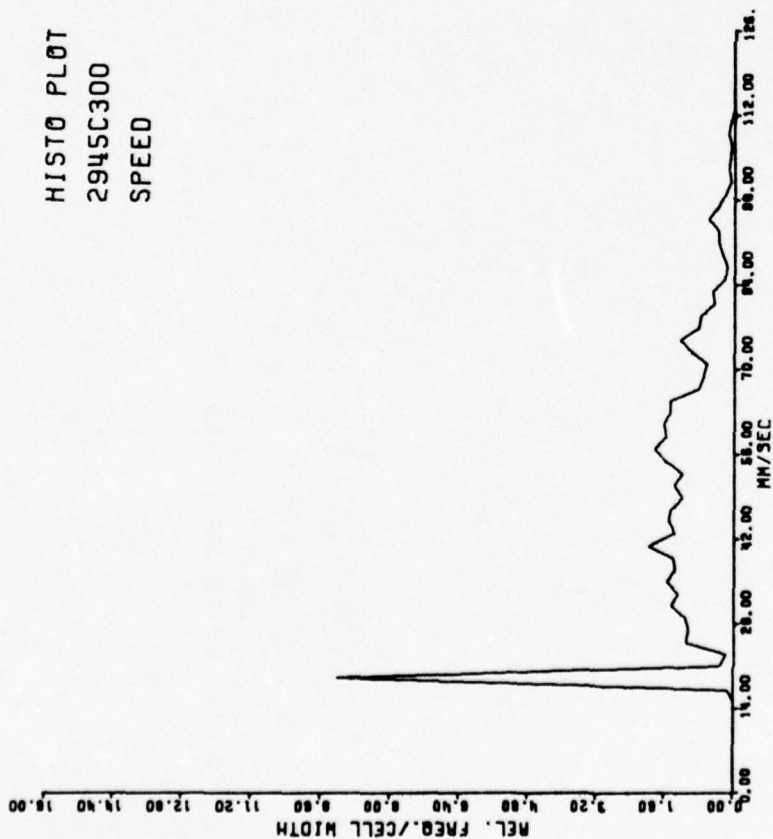
SAMPLE SIZE = 2334 POINTS

SPANNING RANGE

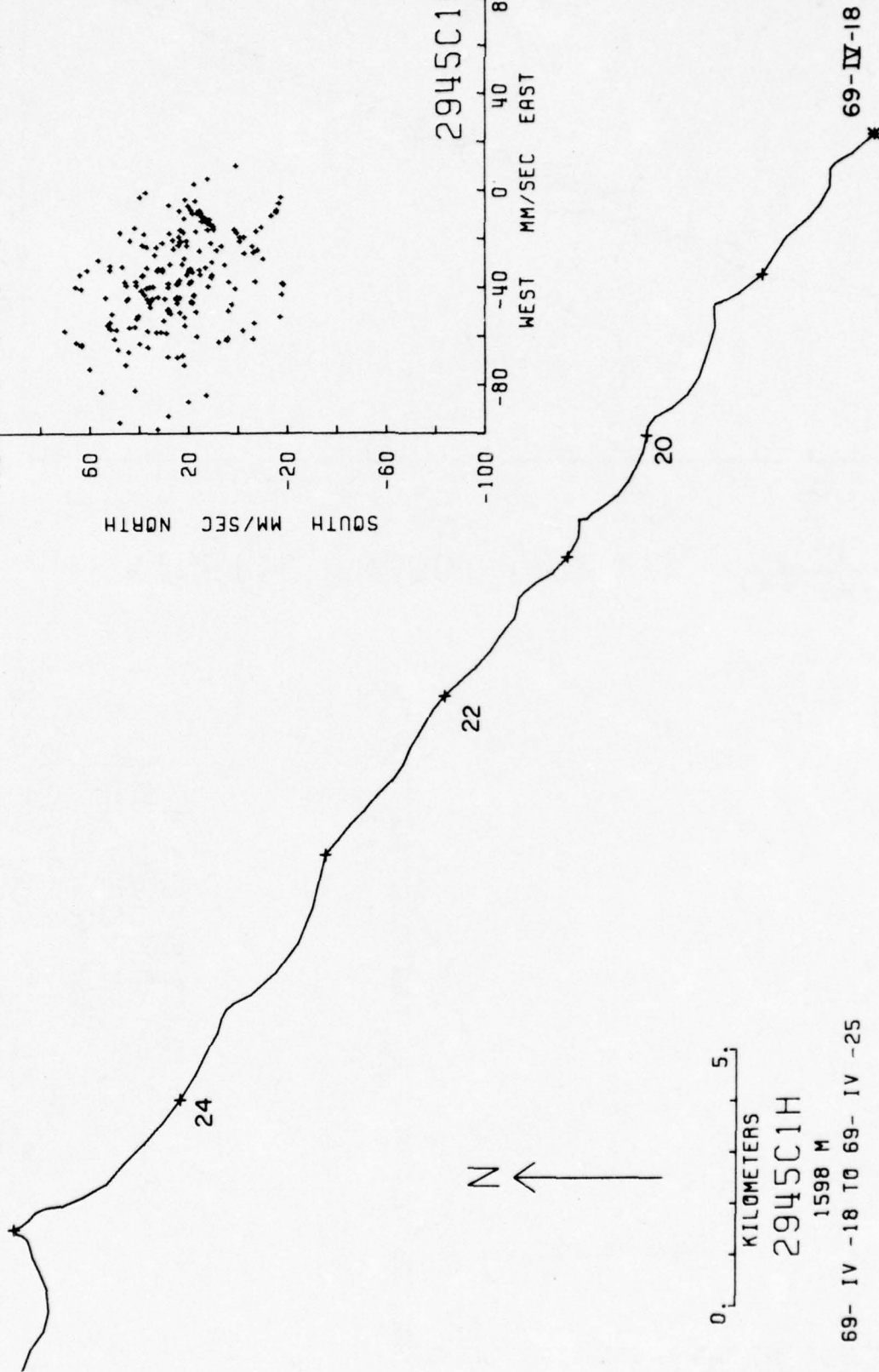
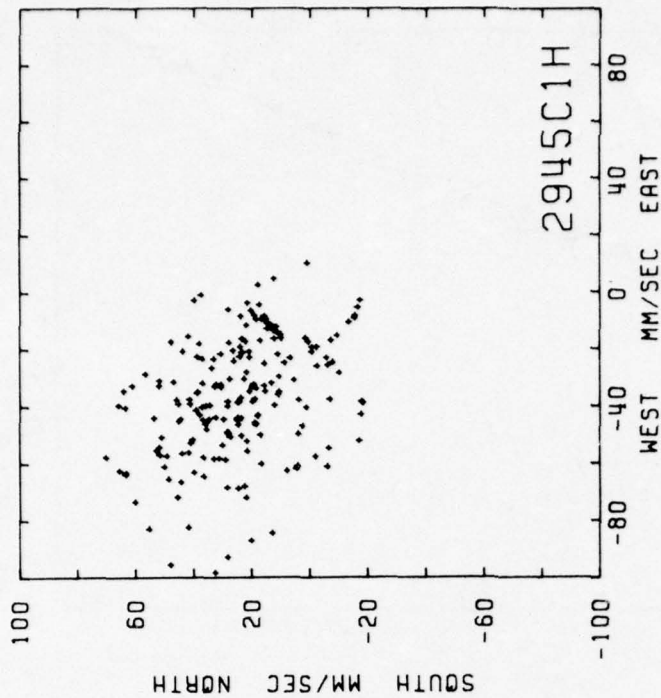
FROM 69- IV -17 20.42.06

TO 69- IV -25 23.07.06

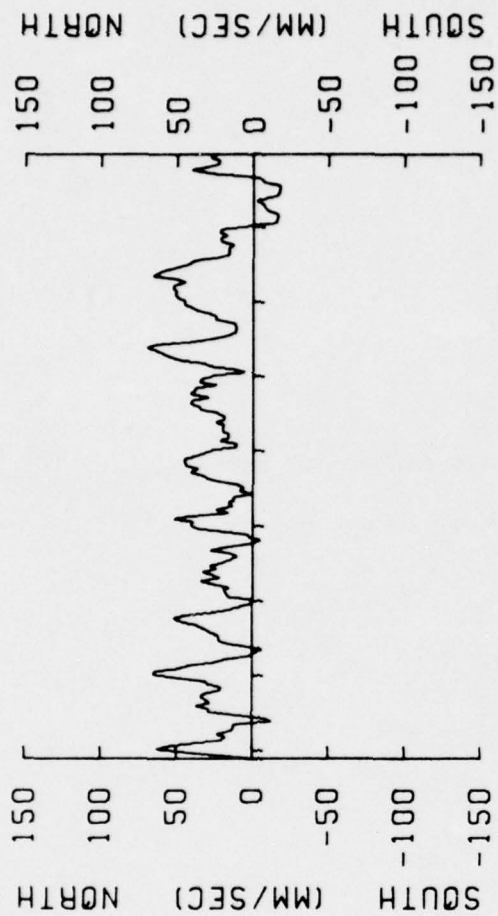
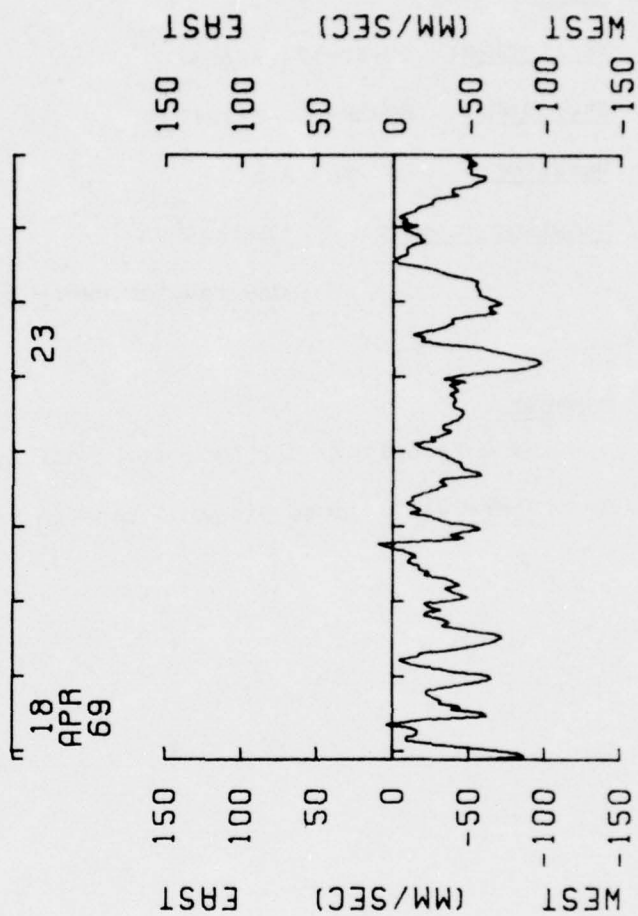
DURATION 8 DAYS 2 H 25 M 0 S



AUTO SPECTRUM
2945C300 EAST COMP
2945C300 NORTH COMP
1598 METERS
69-IV-17 TO 69-IV-25
1 PIECES WITH 1152 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



2945C1H
1598 M



Data number 2946

Instrument No.: M-170

Type: Magnetic tape current meter

Depth: 1614 m

Water depth: 2674 m

Start time: 69-IV-17 204547

Stop time: 69-IV-26 021047

Duration: 8d 5h 25m

Sampling scheme: Continuous

one reading every 5 seconds

COMMENTS:

Vane is sticky. 12-hour clock off by at least 6 minutes 47 seconds.

There was a loose piece of tape in vane cage upon recovery.

STATS

DATA/ 29460300

	EAST	NORTH
MEAN	= -37.42	27.88
STD. ERR.	= .64	.45
VARIANCE	= 869.07	483.77
STD. DEV.	= 31.13	21.99
KURTOSIS	= 3.71	2.46
SKEWNESS	= .35	-.23

SPEED	=	***** EAST & NORTH *****	*****
55.89	=	COVARIANCE	= 61.87
.46	=	STD. ERR. OF COVARIANCE	= 30.20
485.60	=	STD. DEV. OF COVARIANCE	= 1470.15
22.26	=	CORRELATION COEFFICIENT	= .090
3.53	=	VECTOR MEAN	= 46.67
.58	=	VECTOR VARIANCE	= 728.42
	=	STD. DEV.	= 26.95

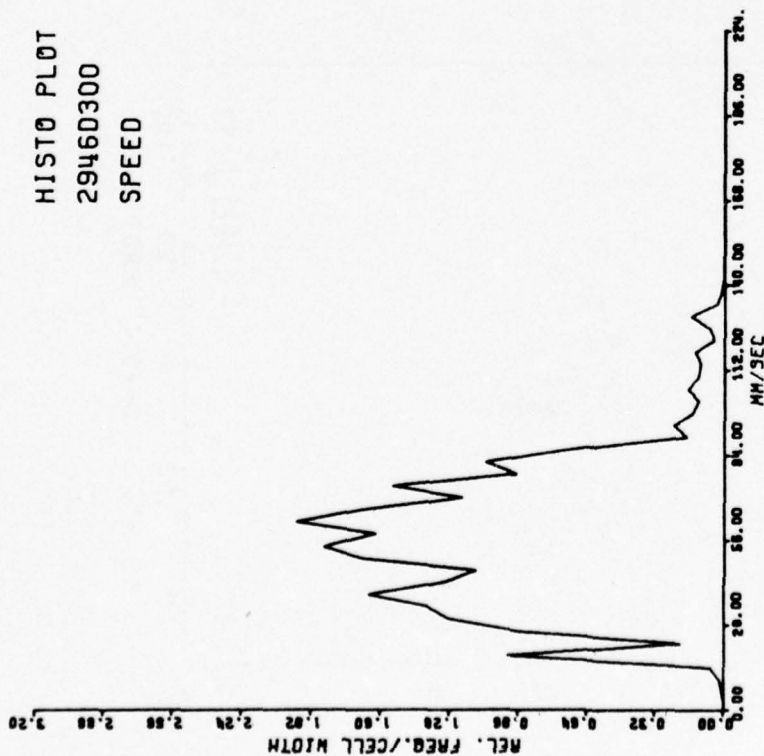
UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2370 POINTS

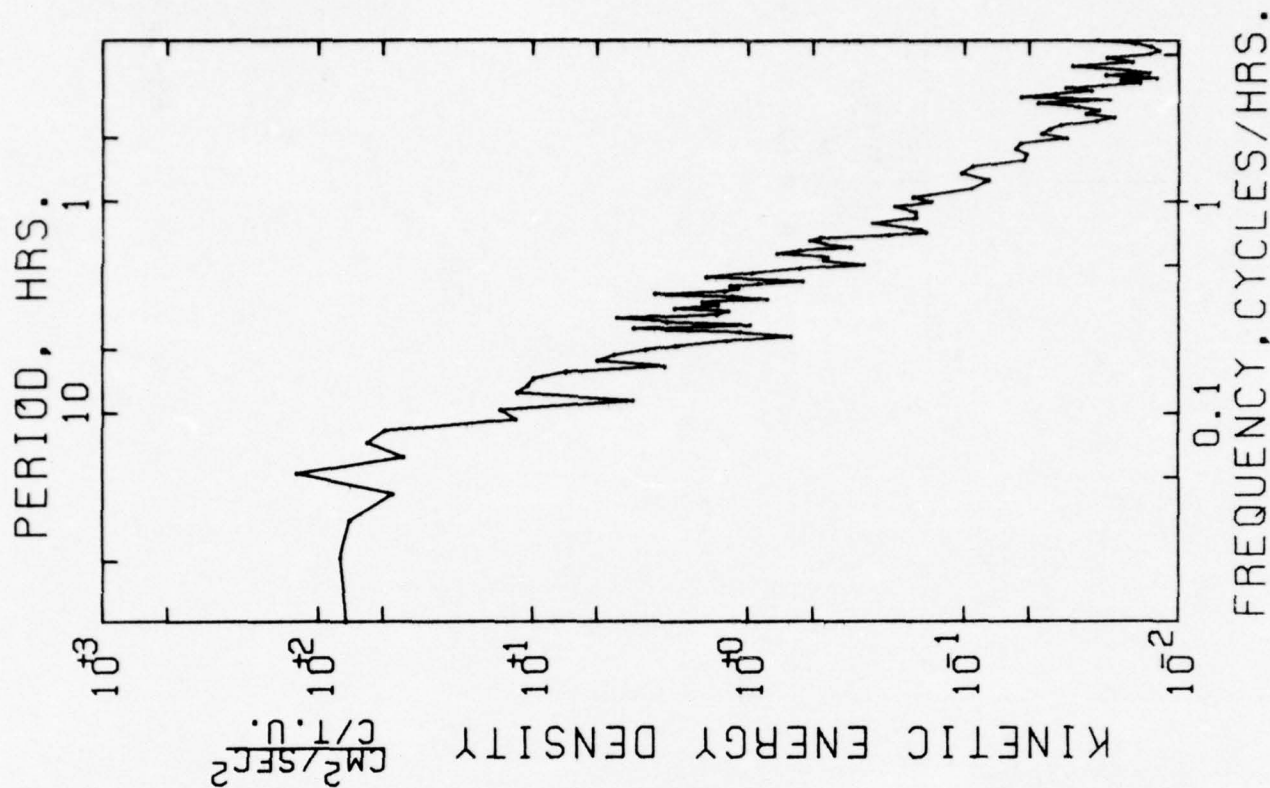
SPANNING RANGE

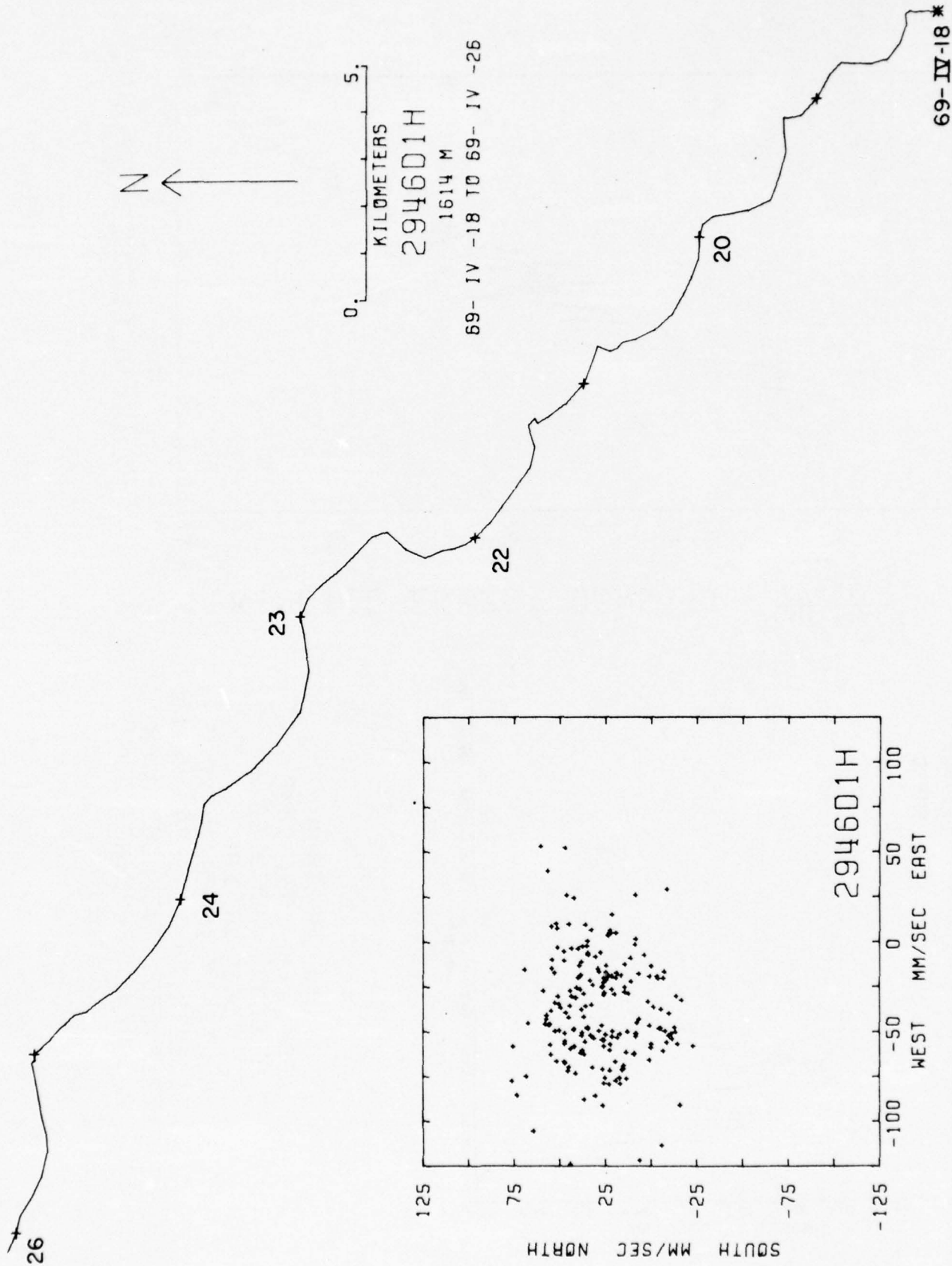
FROM 69- IV -17 20.45.47
TO 69- IV -26 02.10.47

DURATION 8 DAYS 5 H 25 M 0 S

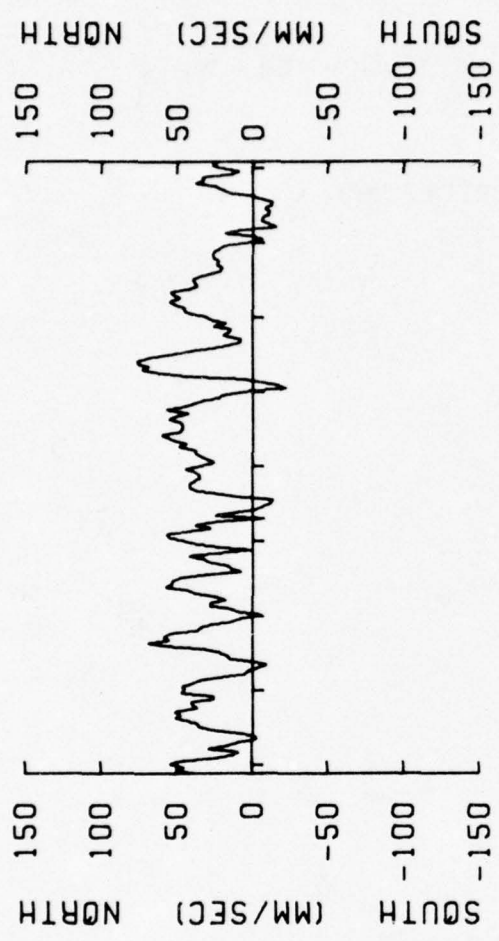
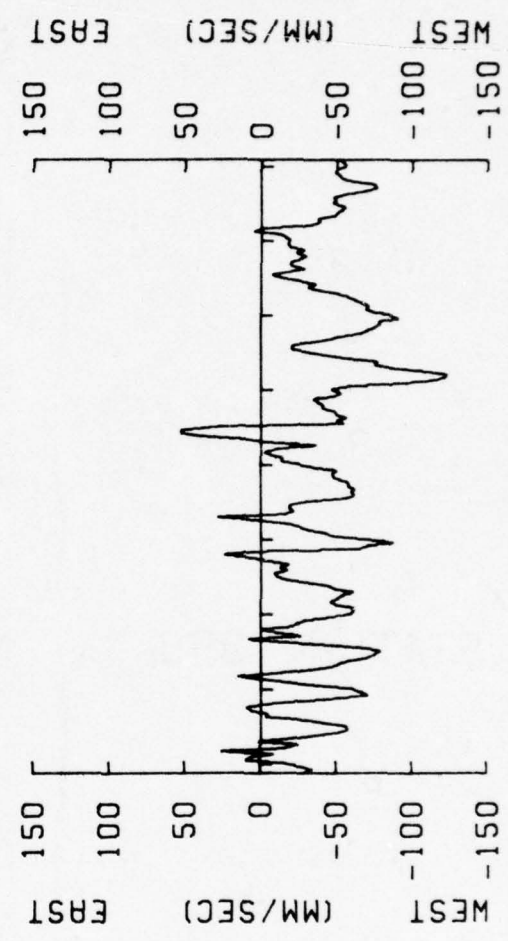


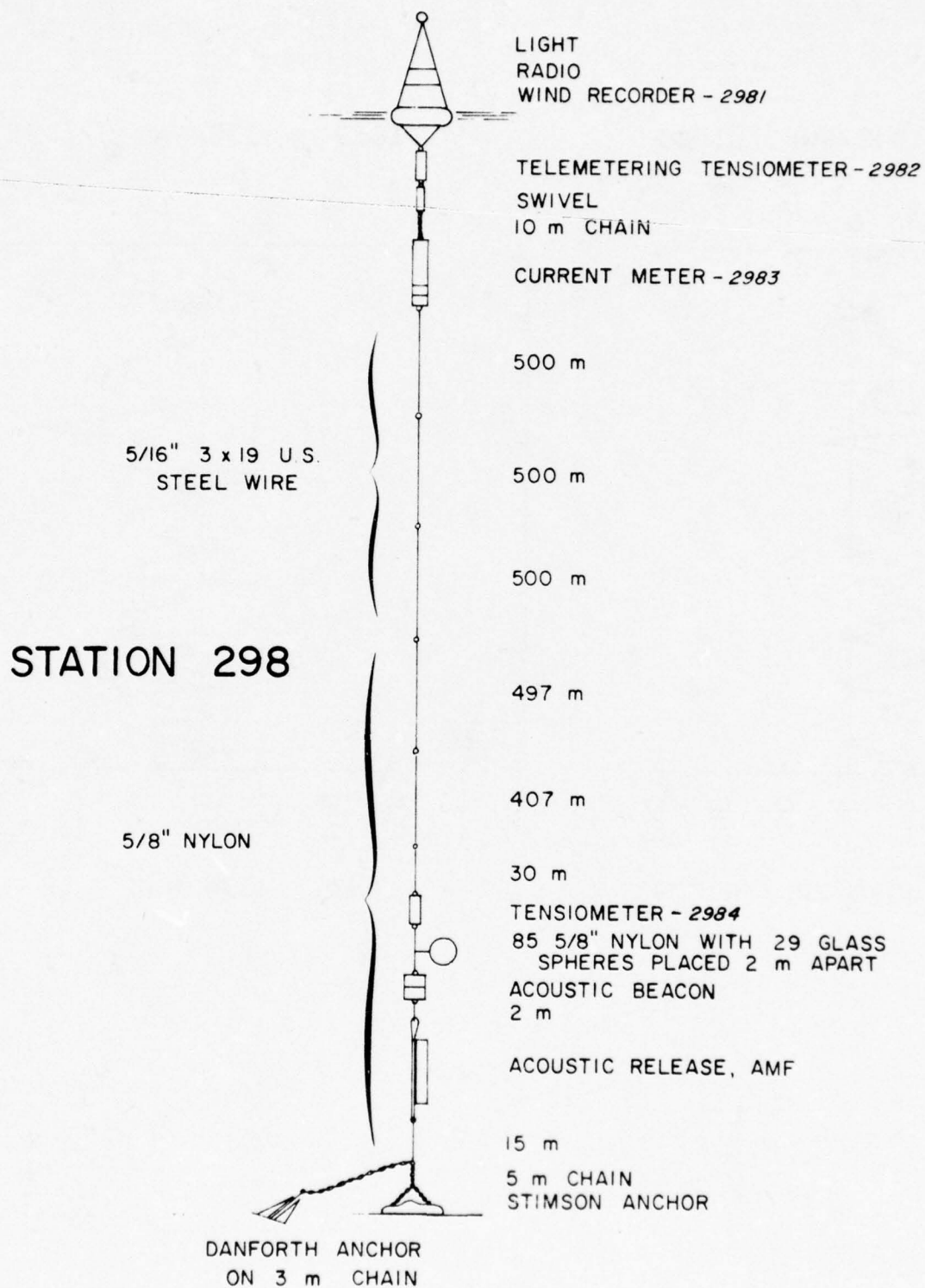
AUTO SPECTRUM
29460300 EAST COMP
29460300 NORTH COMP
1614 METERS
69-IV-17 TO 69-IV-25
1 PIECES WITH 1152 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS





294601H
1614 M





Mooring No. 298

Set 69 Apr 26 39° 09.1N 69° 59.0W
Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R. V. Chain Cruise 90

Retrieved 69 Aug 12
Year Month Day

Retrieved by R. Heinmiller Ship R. V. Chain Cruise 95

Purpose of Mooring: Four-month wire test

Mooring Type: Surface

<u>Data</u> <u>Number</u>	<u>Instrument</u> <u>Number</u>	<u>Type</u>	<u>Depth</u> <u>Meters</u>	<u>Comments</u>
2981*	W-125X	M.W.R.	0	
2982	1013	Tel. Tens.	2	
2983*	M-205	M.C.M.	14	
2984	1019	Tens.	2566	

Water depth 2675

Hydrographic Stations

R. V. Chain cruise 90 Station 879

R. V. Chain cruise 95 Station 922

COMMENTS ON MOORING:

Data number 2981

Instrument No.: W-125X

Type: Magnetic tape wind recorder

Depth: -0-

Water depth: 2675 m

Start time: 69-IV-27 014500

Stop time: 69-VIII-03 234500

Duration: 98d 22h

Sampling scheme: Interval

time between strobos = 5 seconds

no. of strobos per interval = 24

interval time = 1800 seconds

COMMENTS:

Record truncated at August 2, 1969 because of bad anemometer. Wind direction follows ocean current conventions to facilitate comparisons; add 180° to direction for meteorological data.

STATS

DATA/ 2981WL1800

	EAST	NORTH
MEAN	= 10.93	7.68
STD. ERR.	= .63	.73
VARIANCE	= 1904.08	2516.15
STD. DEV.	= 43.64	50.16
KURTOSIS	= 2.98	2.29
SKWNESS	= .09	-.06

SPEED	= *****	EAST & NORTH	*****
61.53	= COVARIANCE	=	881.16
.41	= STD. ERR. OF COVARIANCE	=	30.79
812.71	= STD. DEV. OF COVARIANCE	=	2121.78
28.51	= CORRELATION COEFFICIENT	=	.403
9.20	= VECTOR MEAN	=	13.96
.64	= VECTOR VARIANCE	=	2210.12
	= STD. DEV.	=	47.01

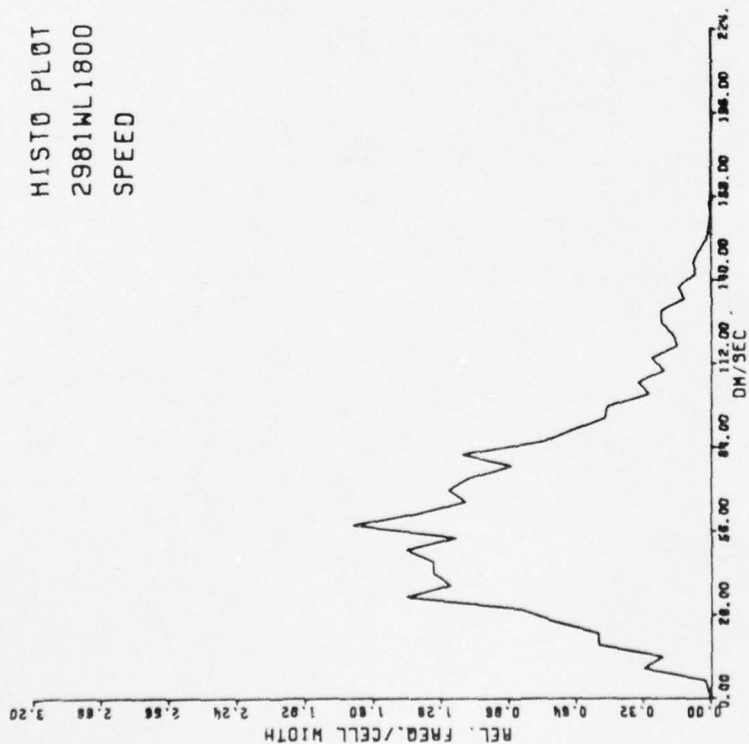
UNITS OF RAW DATA VARIABLES = CM/SEC

SAMPLE SIZE = 4749 POINTS

SPANNING RANGE

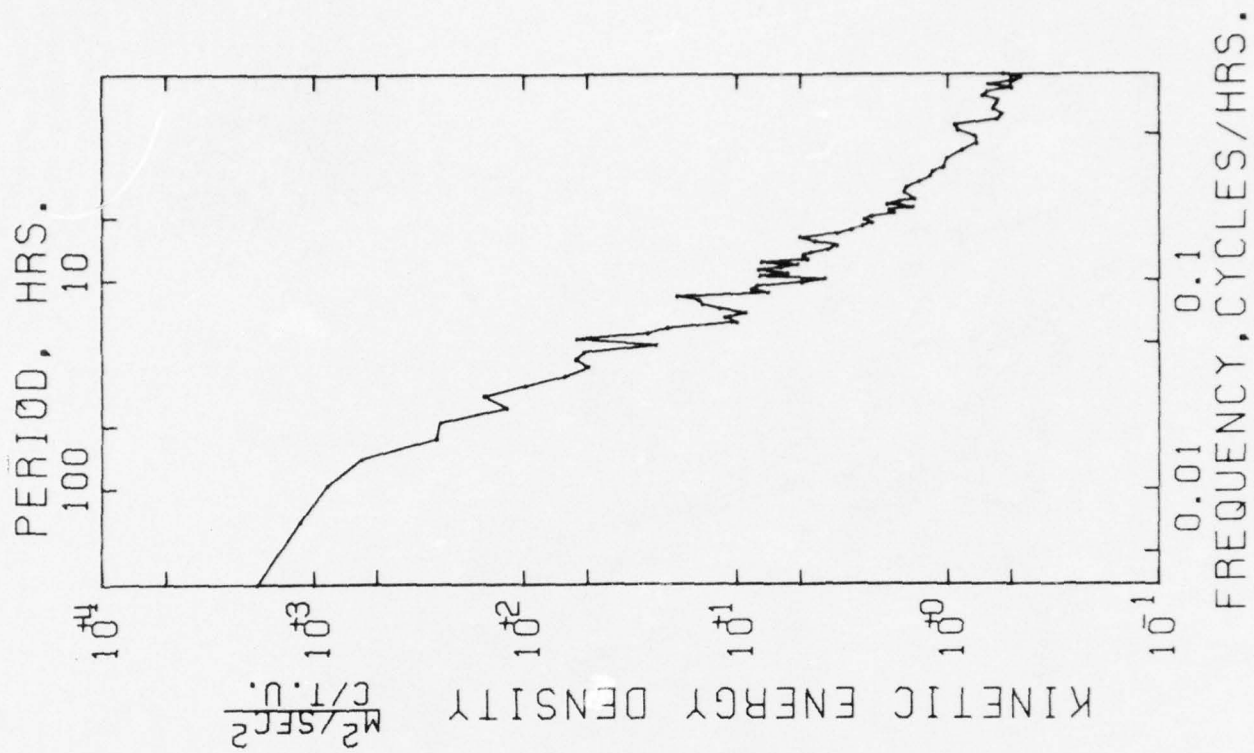
FROM 69- IV -27 01.45.00
TO 69-VIII-03 23.45.00

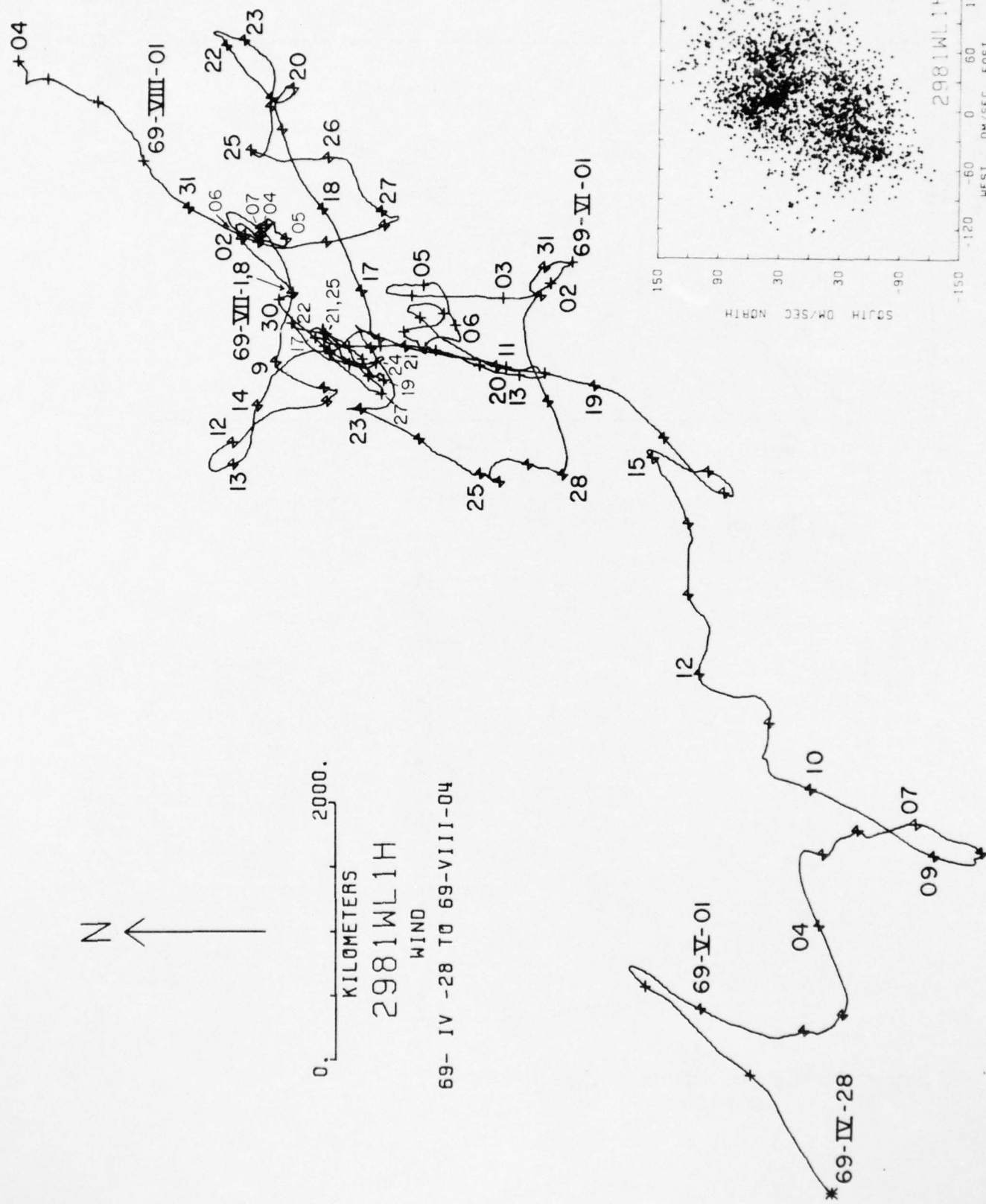
DURATION 98 DAYS 22 H 0 M 0 S

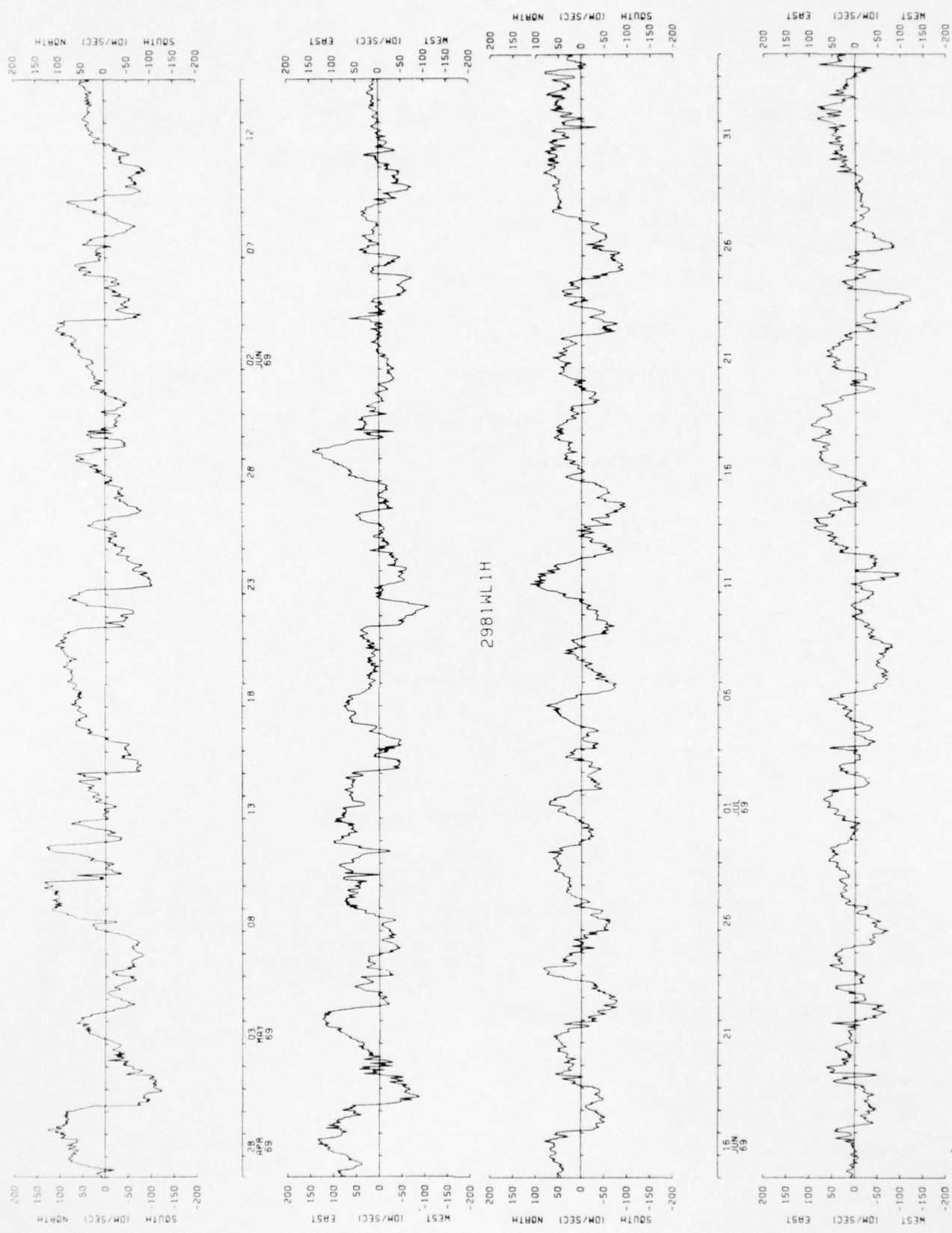


AUTO SPECTRUM
2981WL1800 EAST COMP
2981WL1800 NORTH COMP

69-IV-27 TO 69-VIII-01
1 PIECES WITH 2304 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS







Data number 2983

Instrument No.: M-205

Type: Magnetic tape current meter

Depth: 14 m

Water depth: 2675 m

Start time: 69-IV-27 034507

Stop time: 69-VIII-12 114507

Duration: 107d 8h

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 1800 seconds

COMMENTS:

STATS

DATA/ 2983E1800

MEAN	"	EAST	NORTH	SPEED	"	*****	EAST & NORTH	*****
STD. ERR.	"	-25.02	61.49	328.37	"	COVARIANCE	"	6768.94
VARIANCE	"	3.25	4.28	2.97	"	STD. ERR. OF COVARIANCE	"	1325.53
STD. DEV.	"	54284.86	94537.74	45400.70	"	STD. DEV. OF COVARIANCE	"	95152.24
KURTOSIS	"	232.99	307.47	213.07	"	CORRELATION COEFFICIENT	"	.084
SKEWNESS	"	9.41	9.70	4.19	"	VECTOR MEAN	"	86.39
	"	.20	.06	1.12	"	VECTOR VARIANCE	"	74411.20
					"	STD. DEV.	"	272.78

UNITS OF RAW DATA VARIABLES = MM/SEC

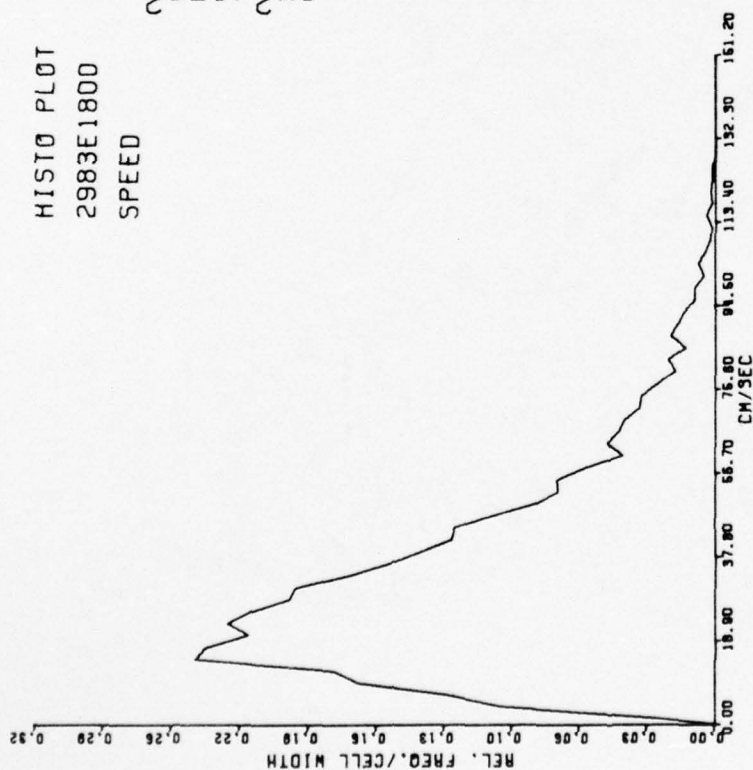
SAMPLE SIZE = 5153 POINTS

SPANNING RANGE

FROM 69- IV -27 03.45.07

TO 69-VIII-12 11.45.07

DURATION 107 DAYS 8 H 0 M 0 S



AUTO SPECTRUM

2983E1800 EAST COMP

2983E1800 NORTH COMP

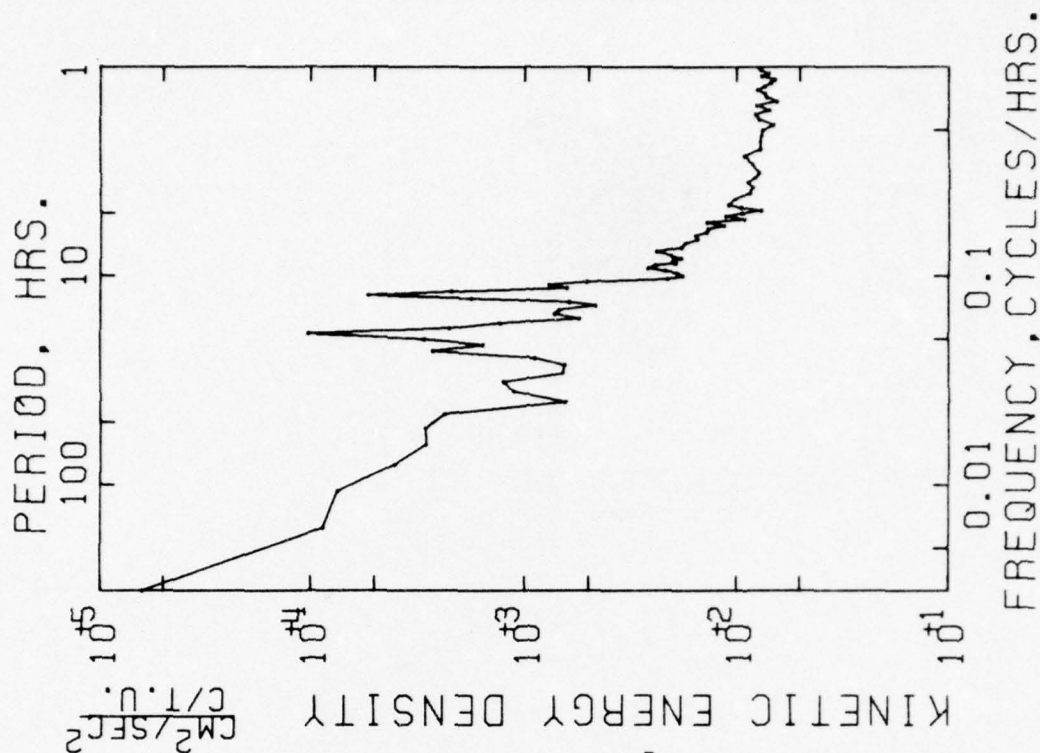
14 METERS

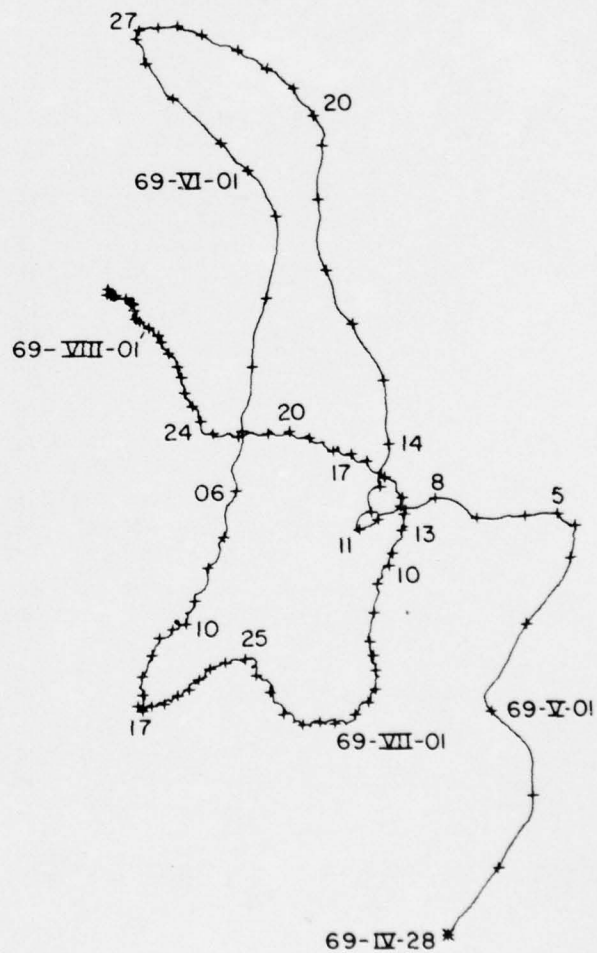
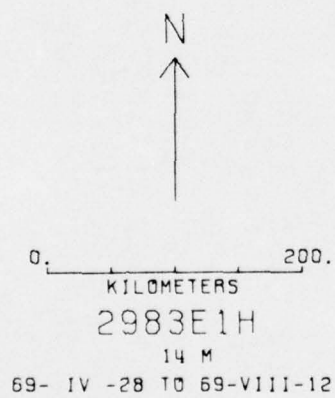
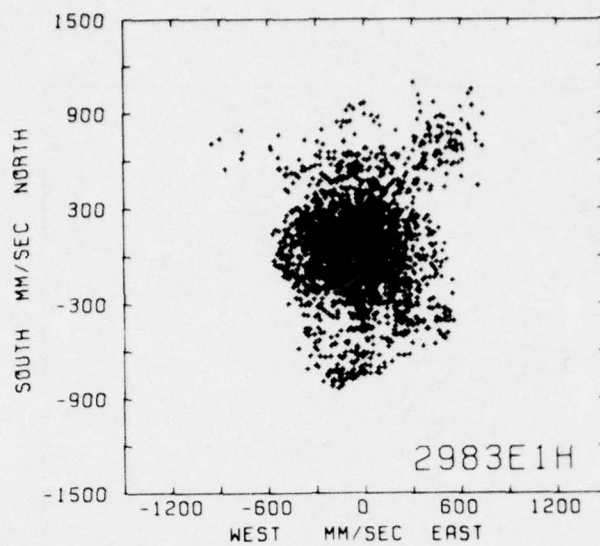
69-IV-27 TO 69-VIII-11

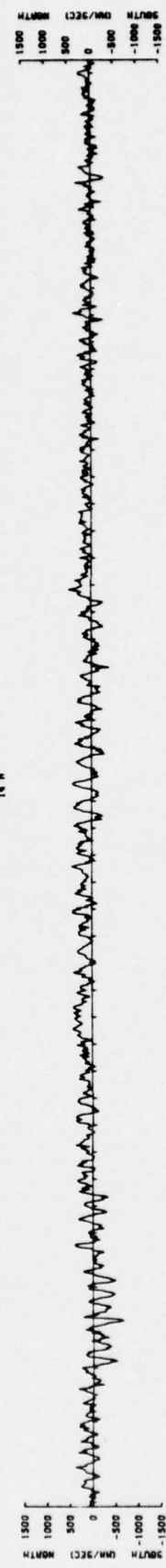
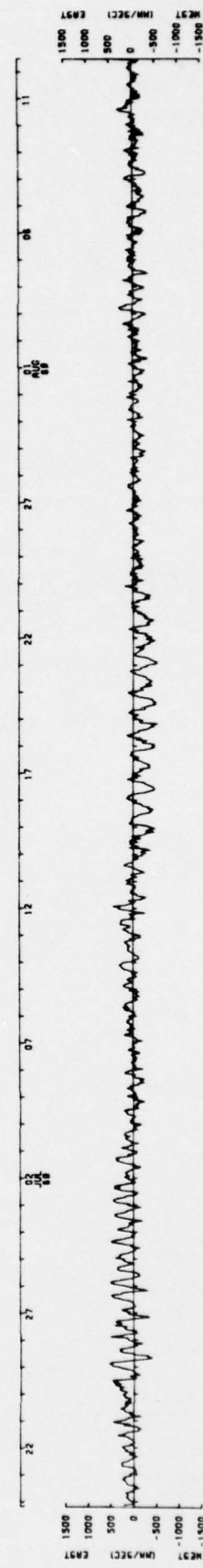
1 PIECES WITH 2560 ESTIMATES

PER PIECE. AVERAGED OVER

8 ADJACENT FREQUENCY BANDS







2983E1H
18 M



STATION 299

ALL SHOTS 3/4" NYLON

DANFORTH ANCHOR ON
3 m CHAIN

LIGHT
RADIO
TELEMETERING WIND RECORDER

JUMBO FLOAT

7 m CHAIN

CURRENT METER, TELEMETERING

CURRENT METER - 2991

36 m NYLON

CURRENT METER - 2992

TEMPERATURE RECORDER - 2993

TENSIOMETER - 2994

52 m

CURRENT METER - 2995

416 m

520 m

520 m

520 m

CURRENT METER - 2996

200 m

TENSIOMETER - 2997
85 m 3/4" NYLON WITH 20 GLASS
SPHERES SPACED 2 m APART
ACOUSTIC BEACON

15 m

ACOUSTIC RELEASE, ORE

15 m

2 STIMSON ANCHORS, PIGGY-BACKED

Mooring No. 299

Set 69 Apr 29 39° 09.0N 70° 03.6W
Year Month Day Latitude Longitude

Set by R. Heinmiller Ship R. V. Chain Cruise 90

Retrieved 69 May 15
Year Month Day

Retrieved by J. Barrett Ship R. V. Chain Cruise 91

Purpose of Mooring: Two-month test of Jumbo telemetry on new 3/4" nylon, combined with the long-term scientific measurement series.

Mooring Type: Surface with Jumbo float.

<u>Data Number</u>	<u>Instrument Number</u>	<u>Type</u>	<u>Depth Meters</u>	<u>Comments</u>
2991*	M-203	M.C.M.	13	
2992*	M-214	M.C.M.	51	
2993	T 452	Temp. Rec.	52	
2994	1016	Tens.	53	
2995*	M-213	M.C.M.	107	
2996*	M-210	M.C.M.	2372	
2997	1014	Tens.	2572	

Water depth 2696

Hydrographic Station

R/V Chain cruise 90 Station 879

COMMENTS ON MOORING:

April 29 the Jumbo float went into the water upside down breaking the main crane on the R. V. Chain.

Telemetry inoperative.

May 9 telemetry repaired by Walden and Collins on the Captain Bill IV.

May 12 R. V. Chain reports Jumbo not on station.

May 15 Mooring recovered complete except for 40 meters of glass ball section which had been cut and the ends tangled together. Only 2 glass balls recovered.

Counter in release indicates it fired on May 6 between 11:00 and 11:30. Possibly by submarines operating in the area.

Data number 2991

Instrument No.: M-203

Type: Magnetic tape current meter

Depth: 13 m

Water depth: 2696 m

Start time: 69-IV-29 191630

Stop time: 69-V-15 100130

Duration: 15d 14h 45m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

Compass channel #2 is off when compass channel #1 is off; when channel #1 is on channel #2 looks O. K.

STATS

DATA/ 2991G900

MEAN	=	EAST	NORTH	SPEED	=	*****	EAST & NORTH	*****
STD. ERR.	=	-10.61	208.83	527.73	=	COVARIANCE	=	4989.63
VARIANCE	=	9.76	8.94	6.13	=	STD. ERR. OF COVARIANCE	=	4535.82
STD. DEV.	=	142986.45	148229.08	56443.82	=	STD. DEV. OF COVARIANCE	=	175671.74
KURTOSIS	=	378.14	385.01	237.58	=	CORRELATION COEFFICIENT	=	.034
SKENNESS	=	1.81	2.83	3.87	=	VECTOR MEAN	=	209.10
	=	.11	.21	.97	=	VECTOR VARIANCE	=	145607.77
					=	STD. DEV.	=	381.59

UNITS OF RAW DATA VARIABLES = MM/SEC

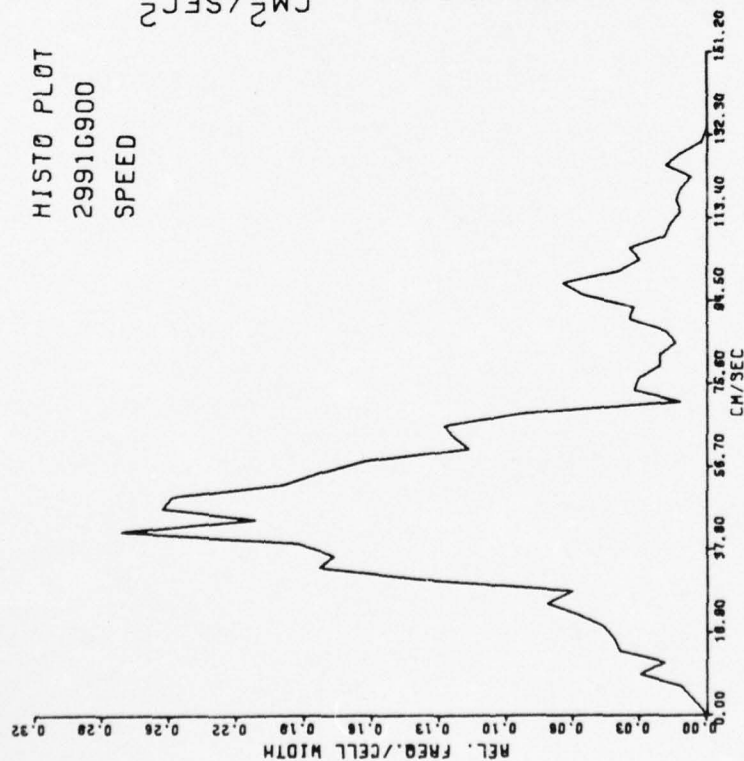
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SPANNING RANGE

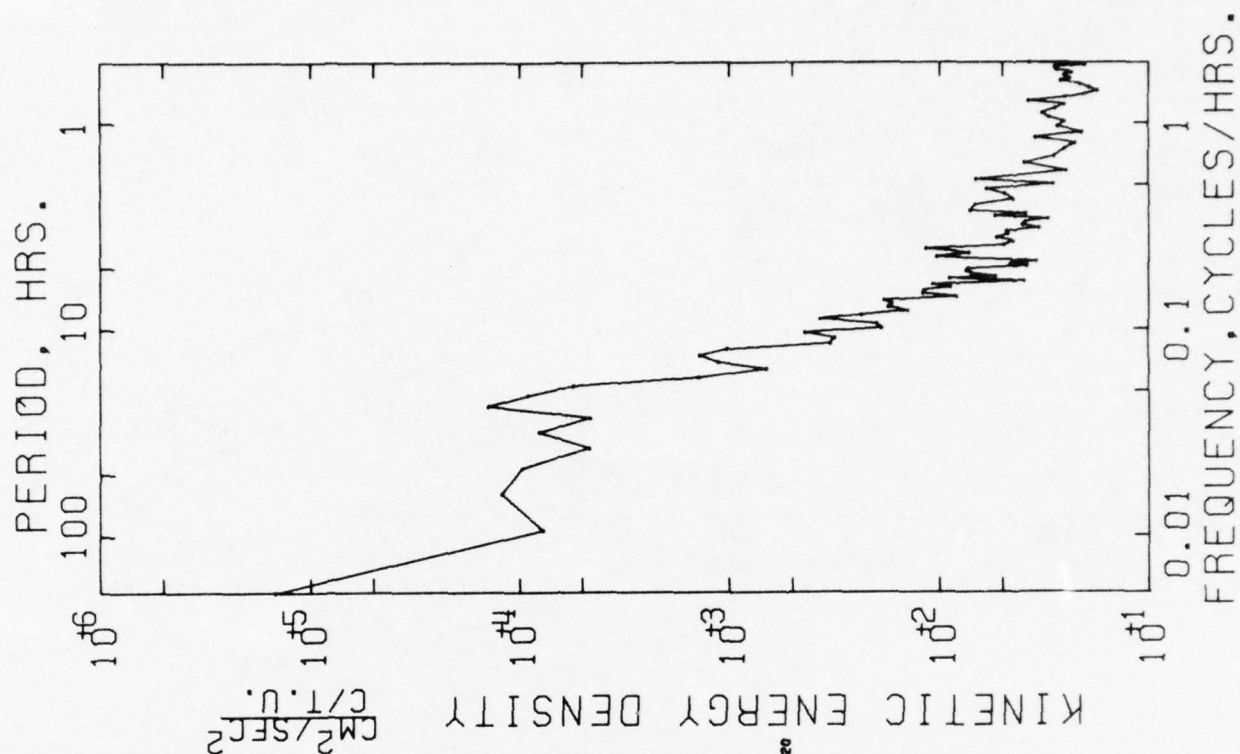
FROM 69- IV -29 19.16.30

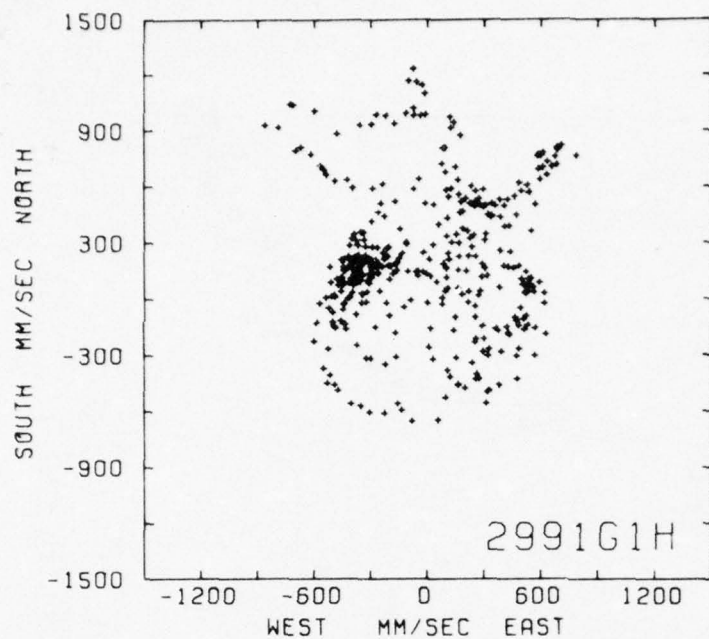
TO 69- V -15 10.01.30

DURATION 15 DAYS 14 H 45 M 0 S



AUTO SPECTRUM
2991G900 EAST COMP
2991G900 NORTH COMP
13 METERS
69-IV-29 TO 69-V-15
1 PIECES WITH 750 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



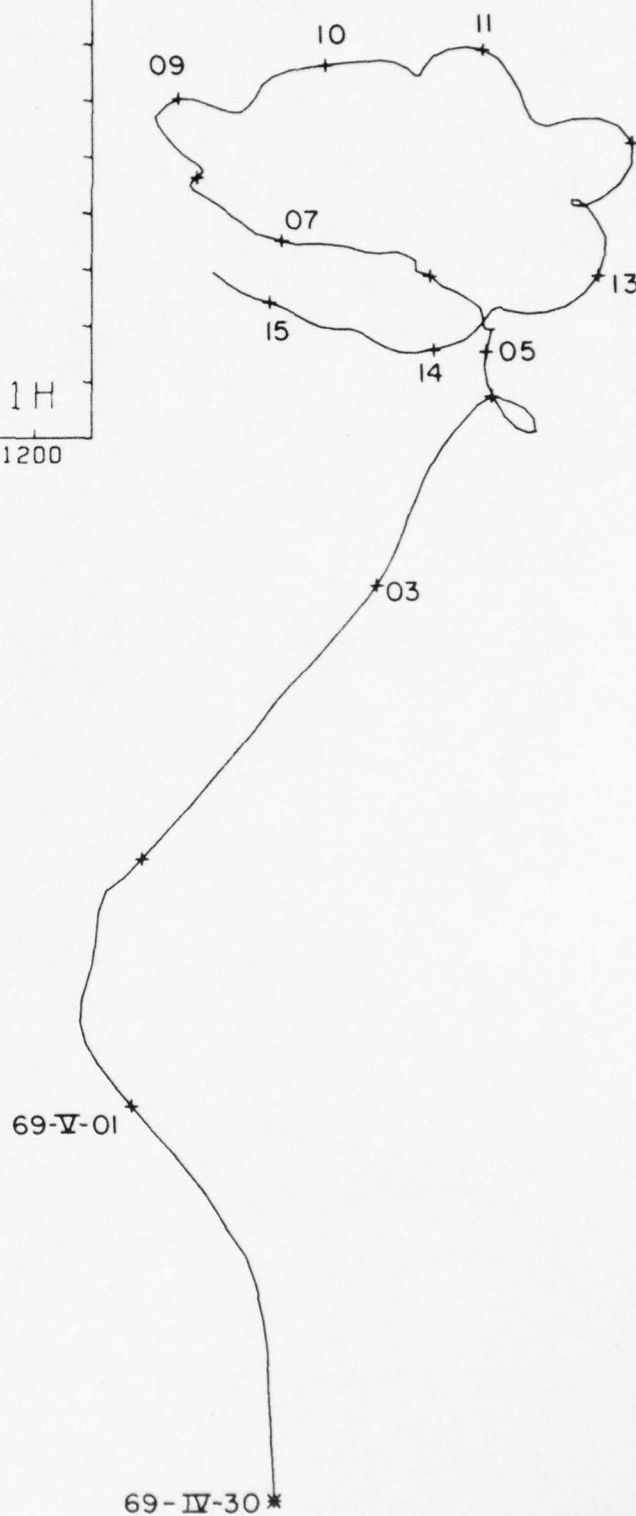


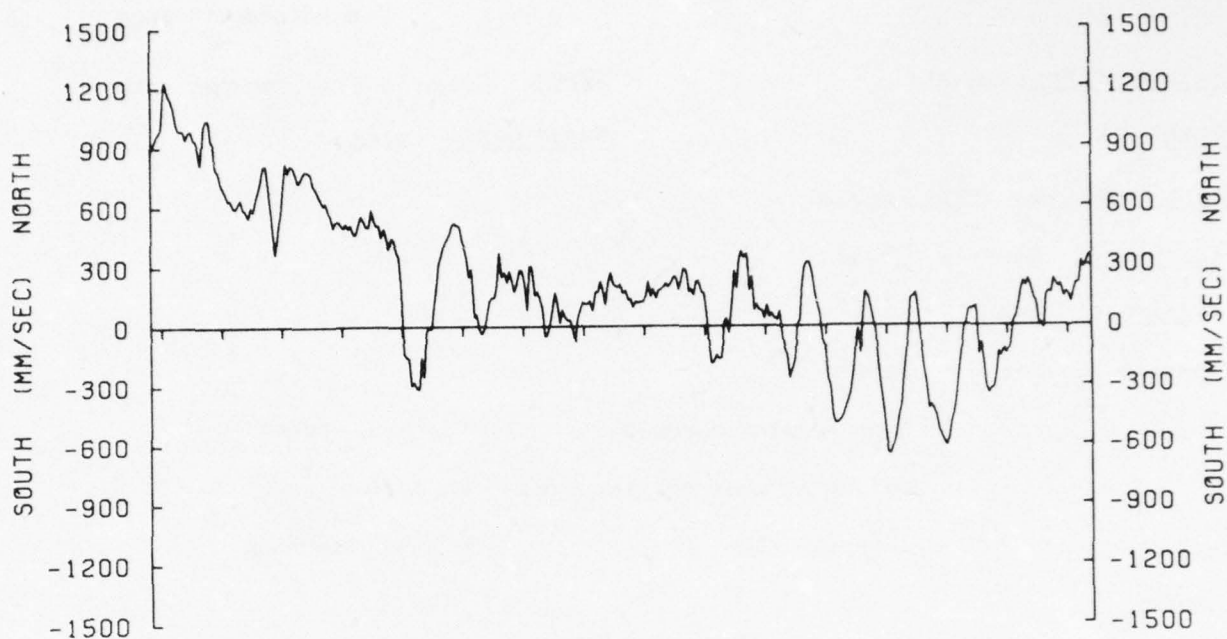
0. 60.
KILOMETERS

2991G1H

13 M

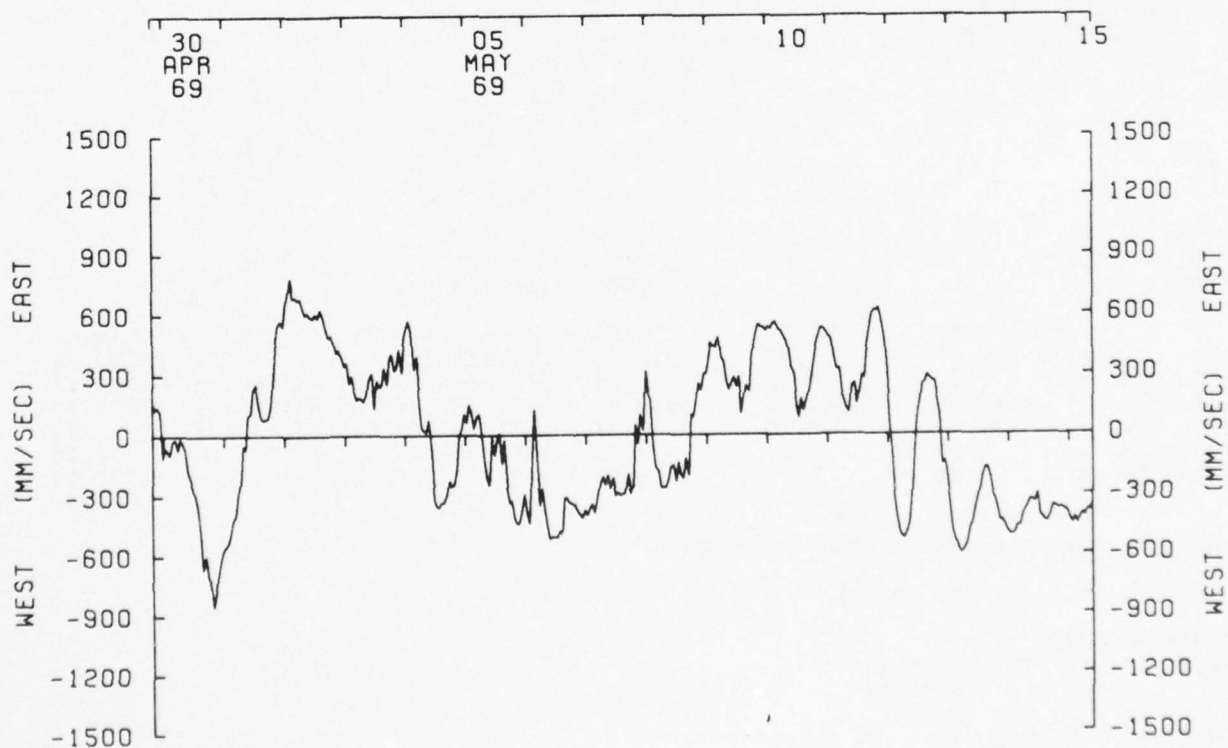
69- IV -30 TO 69- V -15





2991G1H

13 M



AD-A031 858

WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS

F/G 8/3

A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPH--ETC(U)

MAY 76 S A TARBELL

N00014-66-C-0241

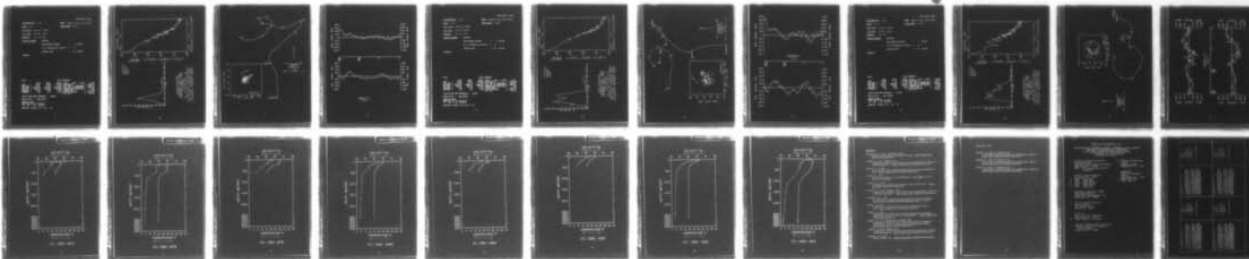
UNCLASSIFIED

WHOI-76-40

NL

2 OF 2

AD
A031 858



END

DATE
FILMED
12-76



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

Data number 2992

Instrument No.: M-214

Type: Magnetic tape current meter

Depth: 51 m

Water depth: 2696 m

Start time: 69-IV-29 202040

Stop time: 69-V-15 100540

Duration: 15d 13h 45m

Sampling scheme: Interval

time between strobos = 5 seconds

no. of strobos per interval = 24

interval time = 900 seconds

COMMENTS:

STATS

DATA/ 2992C900

MEAN	=	EAST	NORTH	SPEED	=	*****	EAST & NORTH	*****
STD. ERR.	=	-52.97	101.90	318.36	=	COVARIANCE	=	21551.26
VARIANCE	=	8.01	7.20	5.30	=	STD. ERR. OF COVARIANCE	=	1089.53
STD. DEV.	=	54097.70	77504.97	43378.06	=	STD. DEV. OF COVARIANCE	=	76951.37
KURTOSIS	=	292.46	278.40	208.27	=	CORRELATION COEFFICIENT	=	.333
SKEWNESS	=	9.07	4.65	4.93	=	VECTOR MEAN	=	114.85
		.85	1.21	1.53	=	VECTOR VARIANCE	=	85771.94
					=	STD. DEV.	=	256.46

UNITS OF RAW DATA VARIABLES = MM/SEC

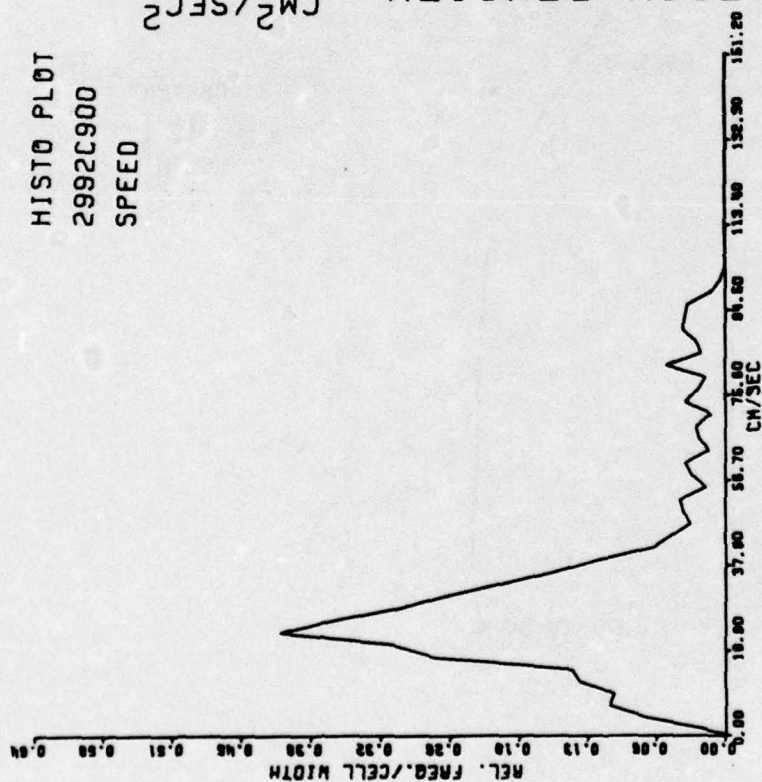
SAMPLE SIZE = 1496 POINTS

SPANNING RANGE

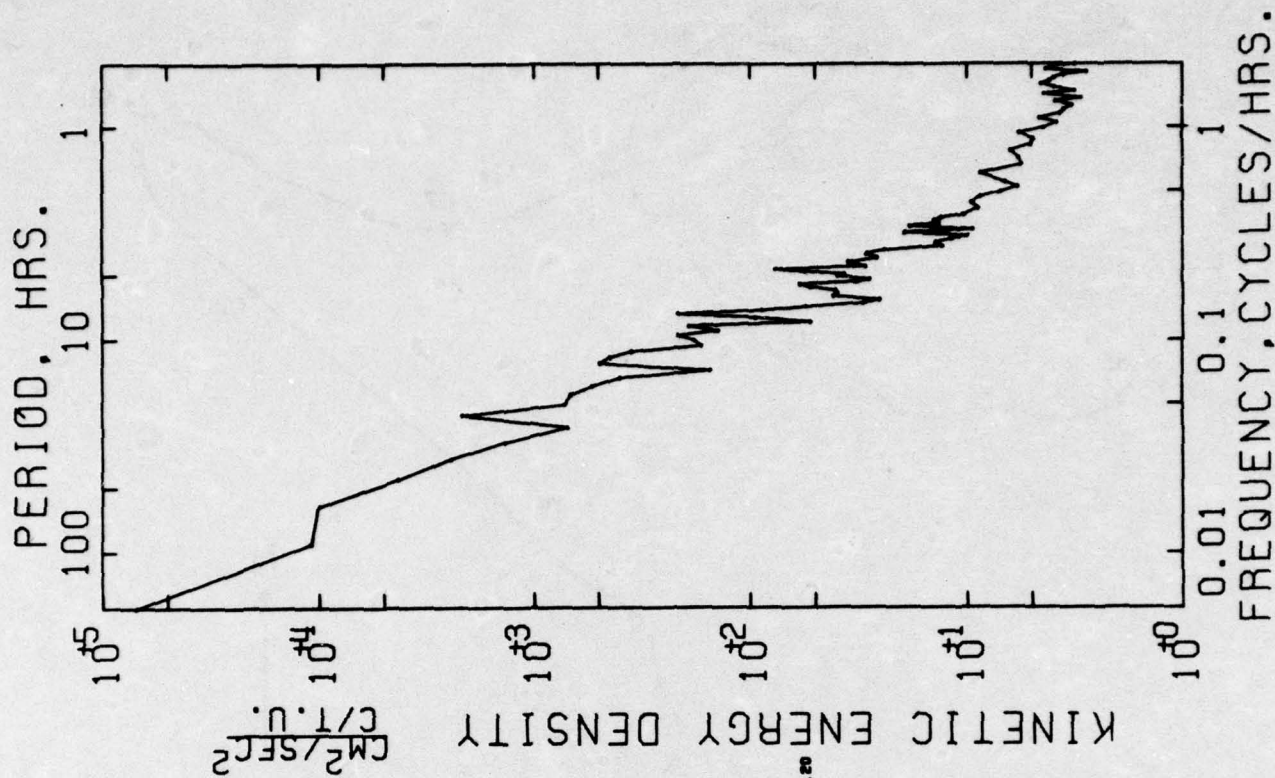
FROM 69- IV -29 20.20.40

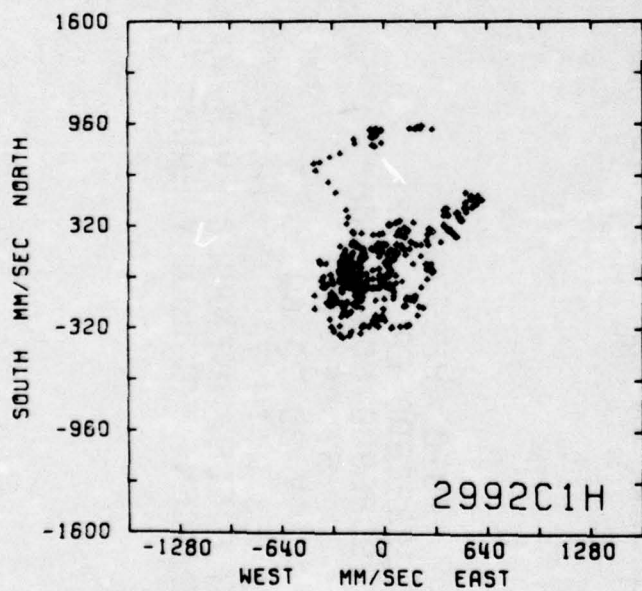
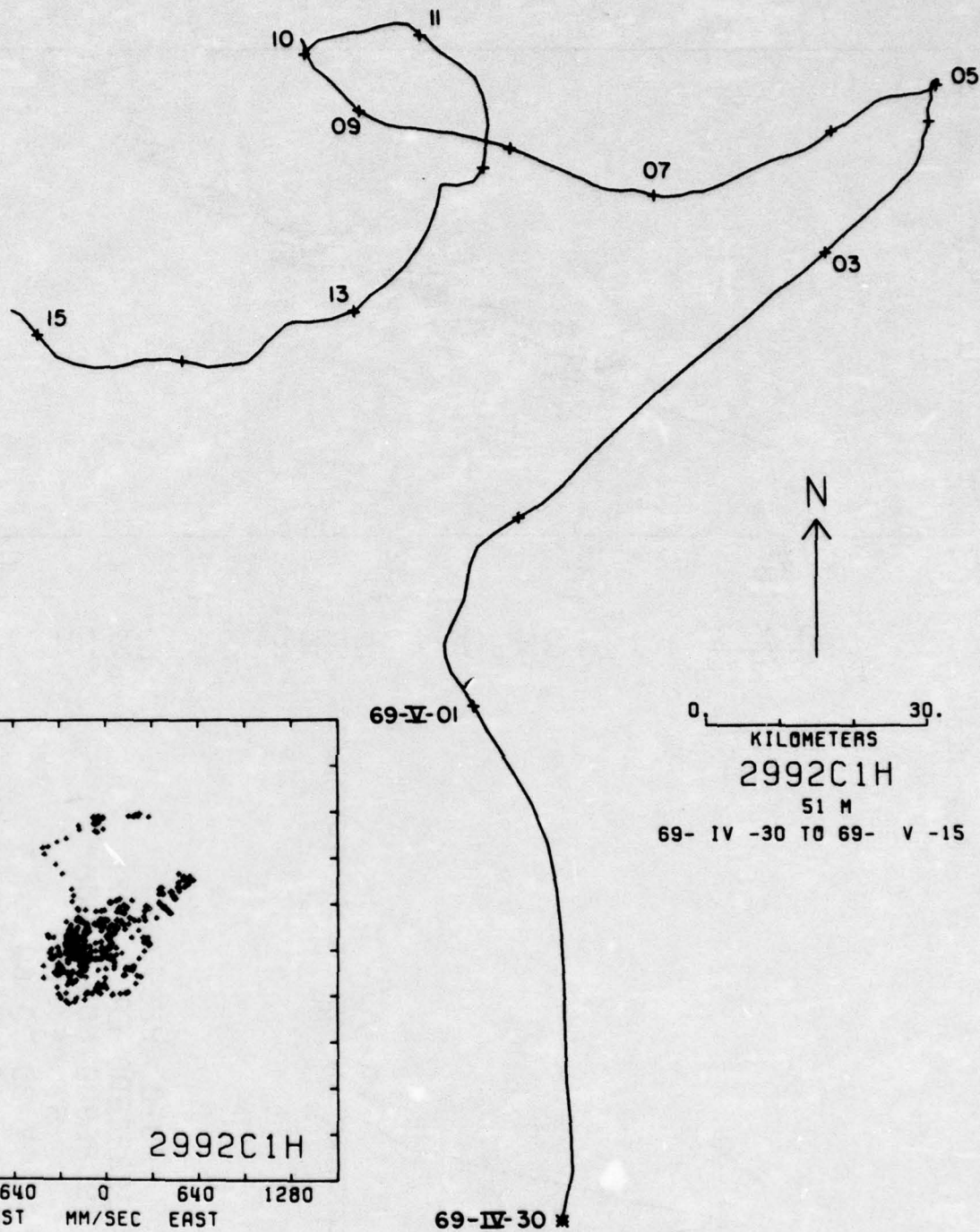
TO 69- V -15 10.05.40

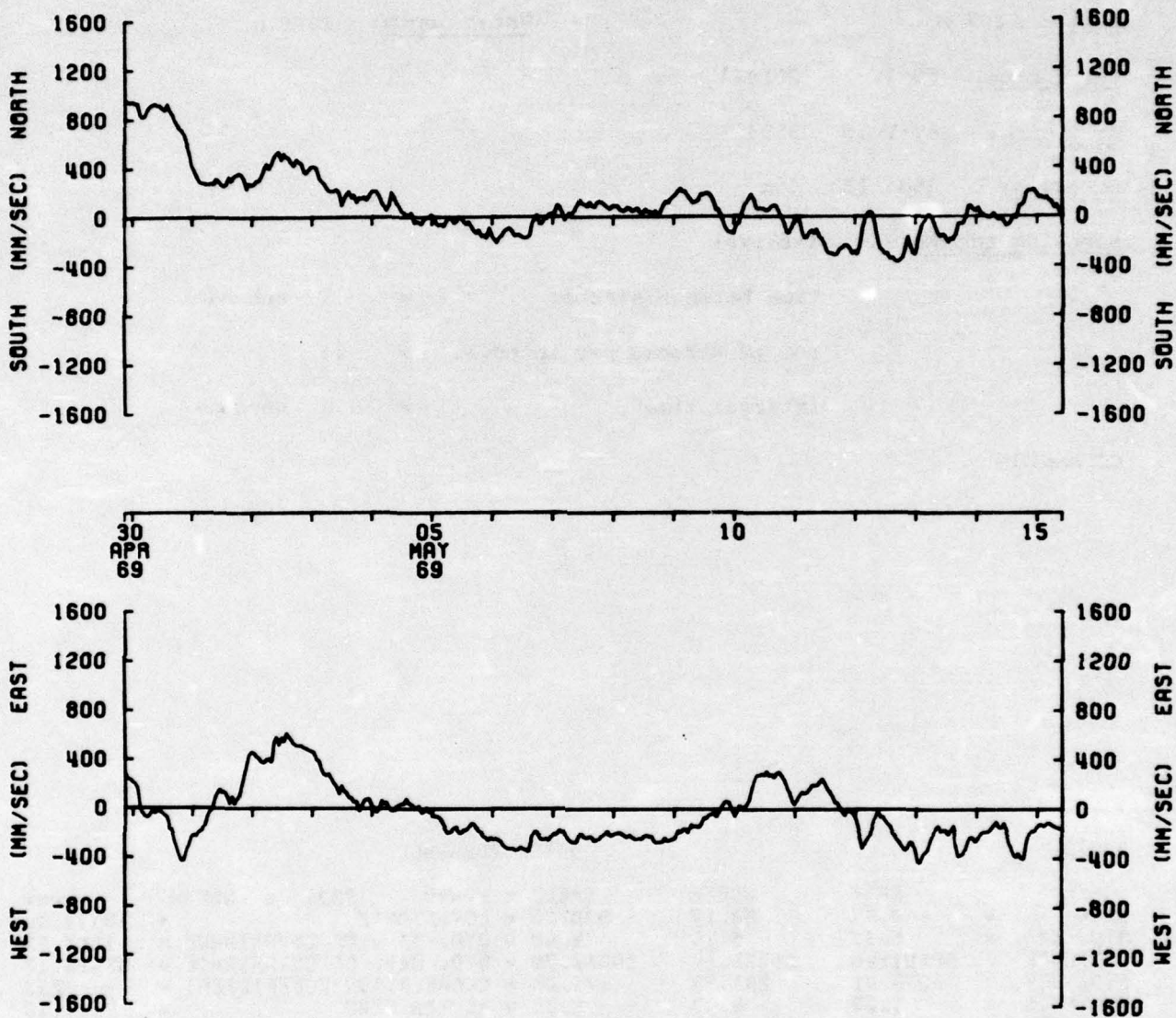
DURATION 15 DAYS 13 H 45 M 0 S



AUTO SPECTRUM
2992C900 EAST COMP
2992C900 NORTH COMP
51 METERS
69-IV-29 TO 69-V-15
1 PIECES WITH 729 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS







2992C1H
51 M

Data number 2995

Instrument No.: M-213

Type: Magnetic tape current meter

Depth: 107 m

Water depth: 2696 m

Start time: 69-IV-29 201440

Stop time: 69-V-15 095940

Duration: 15d 13h 45m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

STATS

DATA/ 29958900

MEAN	=	EAST	NORTH	SPEED	=	*****	EAST & NORTH	*****
STD. ERR.	=	-60.64	93.17	320.00	=	COVARIANCE	=	13772.08
VARIANCE	=	5.83	8.76	4.42	=	STD. ERR. OF COVARIANCE	=	1383.88
STD. DEV.	=	50901.40	88408.14	29288.76	=	STD. DEV. OF COVARIANCE	=	53526.17
KURTOSIS	=	225.61	261.55	171.08	=	CORRELATION COEFFICIENT	=	.293
SKEWNESS	=	1.97	4.47	5.54	=	VECTOR MEAN	=	111.18
	=	.28	.94	1.40	=	VECTOR VARIANCE	=	59854.77
					=	STD. DEV.	=	244.24

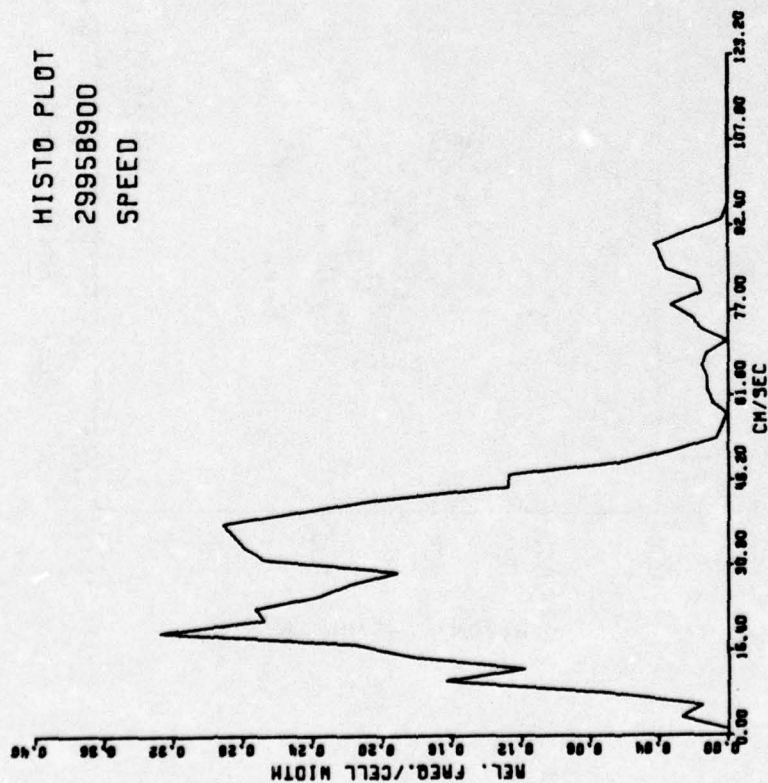
UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1496 POINTS

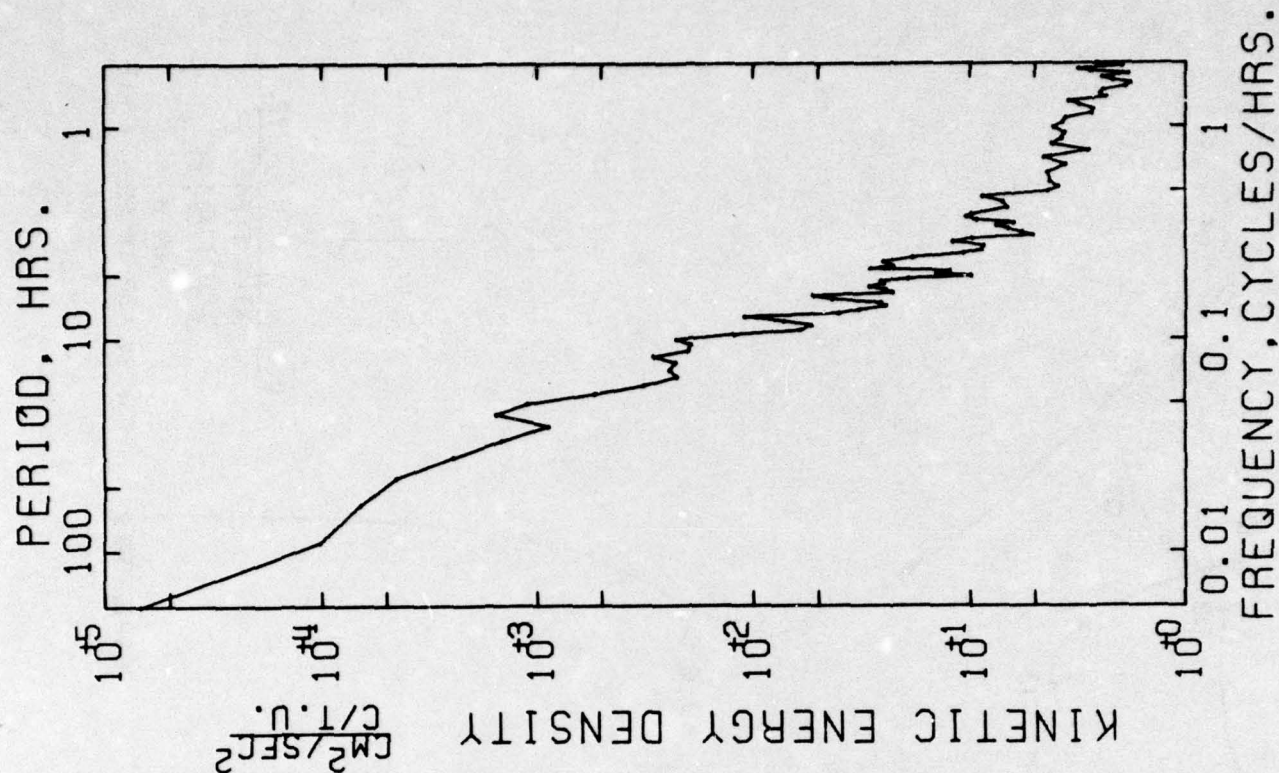
SPANNING RANGE

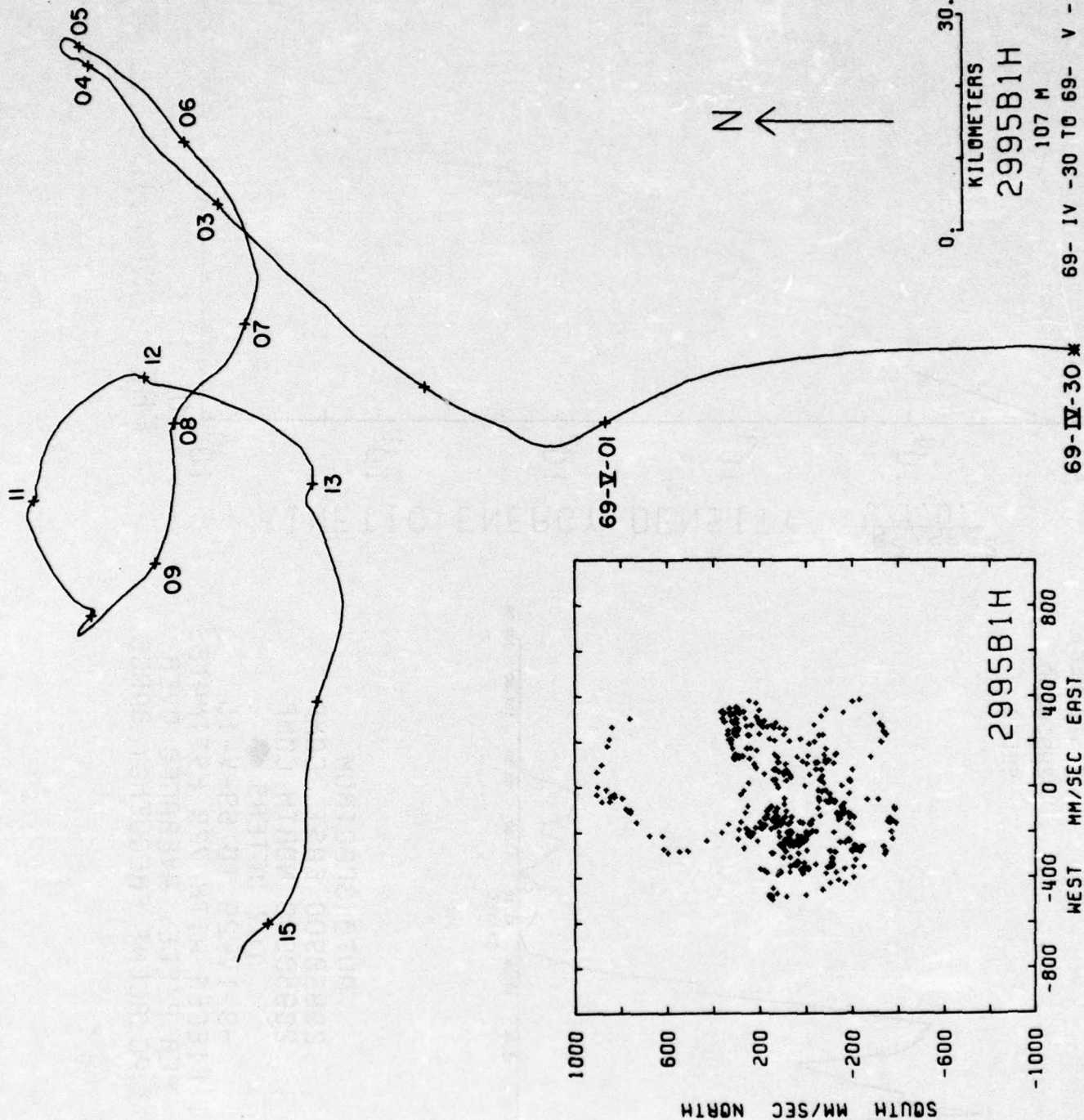
FROM 69- IV -29 20.14.40
TO 69- V -15 09.59.40

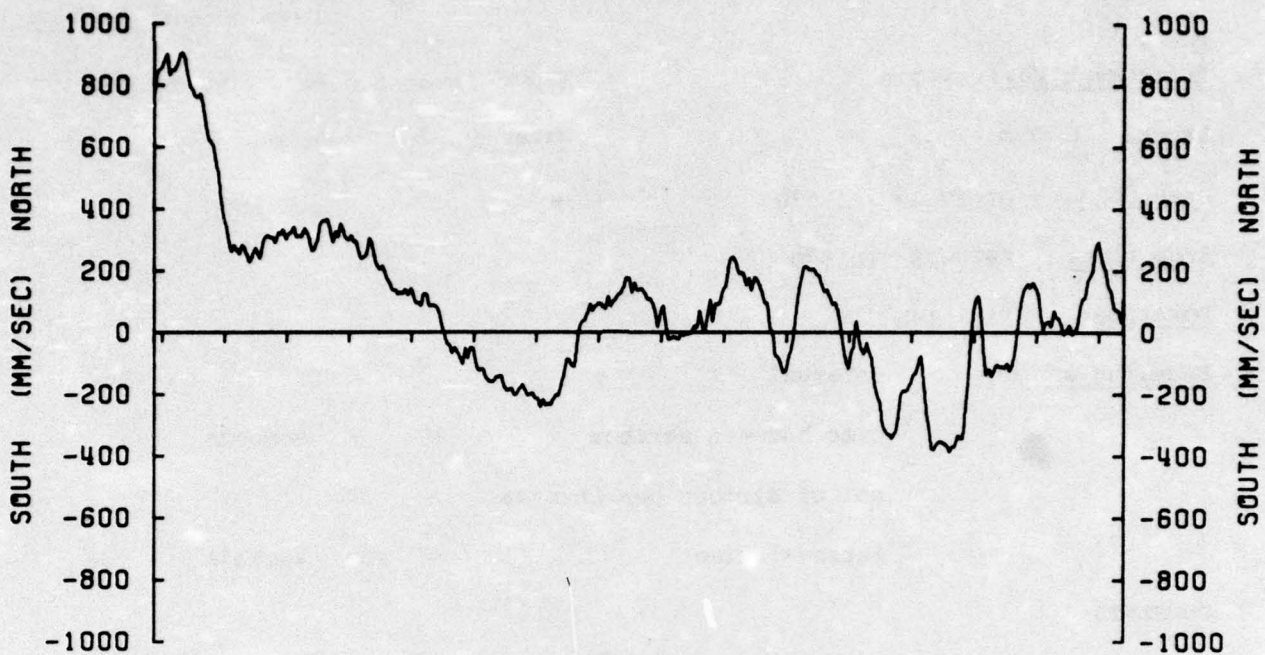
DURATION 15 DAYS 13 H 45 M 0 S



AUTO SPECTRUM
29958900 EAST COMP
29958900 NORTH COMP
107 METERS
69-IV-29 TO 69-V-15
1 PIECES WITH 729 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS

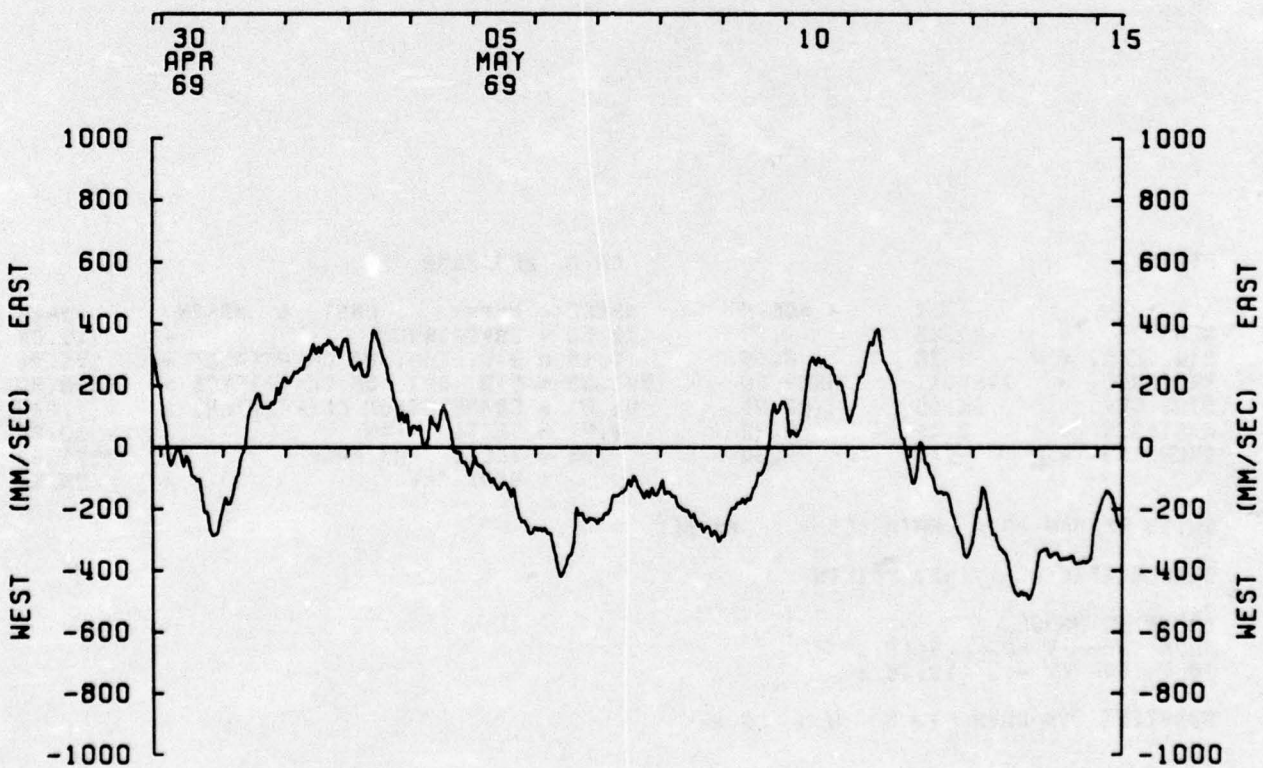






2995B1H

107 M



Data number 2996

Instrument No.: M-210

Type: Magnetic tape current meter

Depth: 2372 m

Water depth: 2696 m

Start time: 69-IV-29 201830

Stop time: 69-V-15 101830

Duration: 15d 14h

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 24

interval time = 900 seconds

COMMENTS:

STATS

DATA/ 2996F800

MEAN	=	EAST	NORTH	SPEED	=	*****	EAST & NORTH	*****
STD. ERR.	=	-30.23	.77	118.85	=	COVARIANCE	=	715.02
VARIANCE	=	2.20	2.15	1.13	=	STD. ERR. OF COVARIANCE	=	175.71
STD. DEV.	=	7754.11	6887.96	1801.88	=	STD. DEV. OF COVARIANCE	=	6788.30
KURTOSIS	=	88.06	82.88	49.61	=	CORRELATION COEFFICIENT	=	.088
SKENNESS	=	2.41	2.42	2.81	=	VECTOR MEAN	=	30.24
	=	.28	-.30	.53	=	VECTOR VARIANCE	=	7321.04
					=	STD. DEV.	=	85.56

UNITS OF RAW DATA VARIABLES = MM/SEC

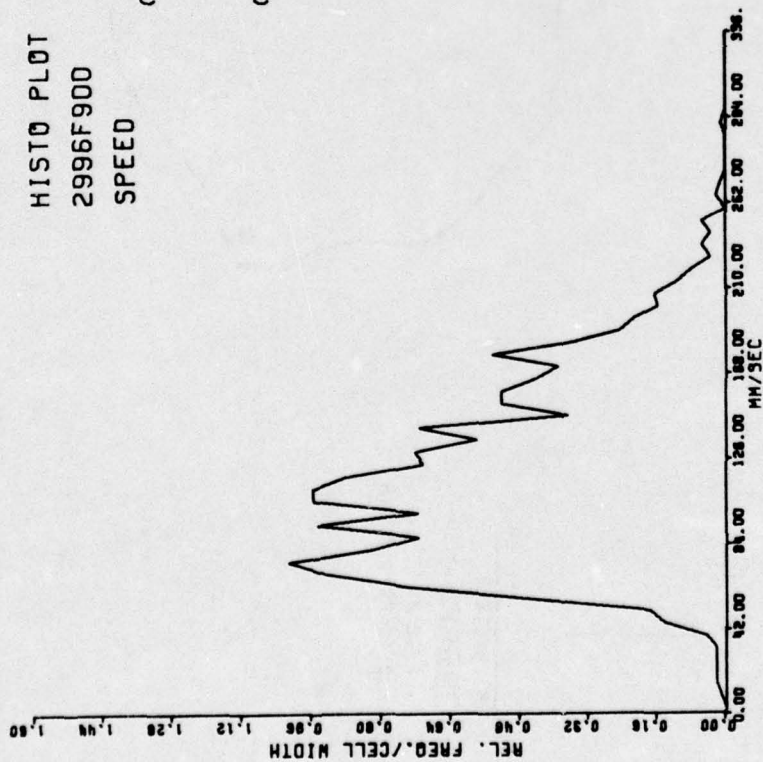
SAMPLE SIZE = 1487 POINTS

SPANNING RANGE

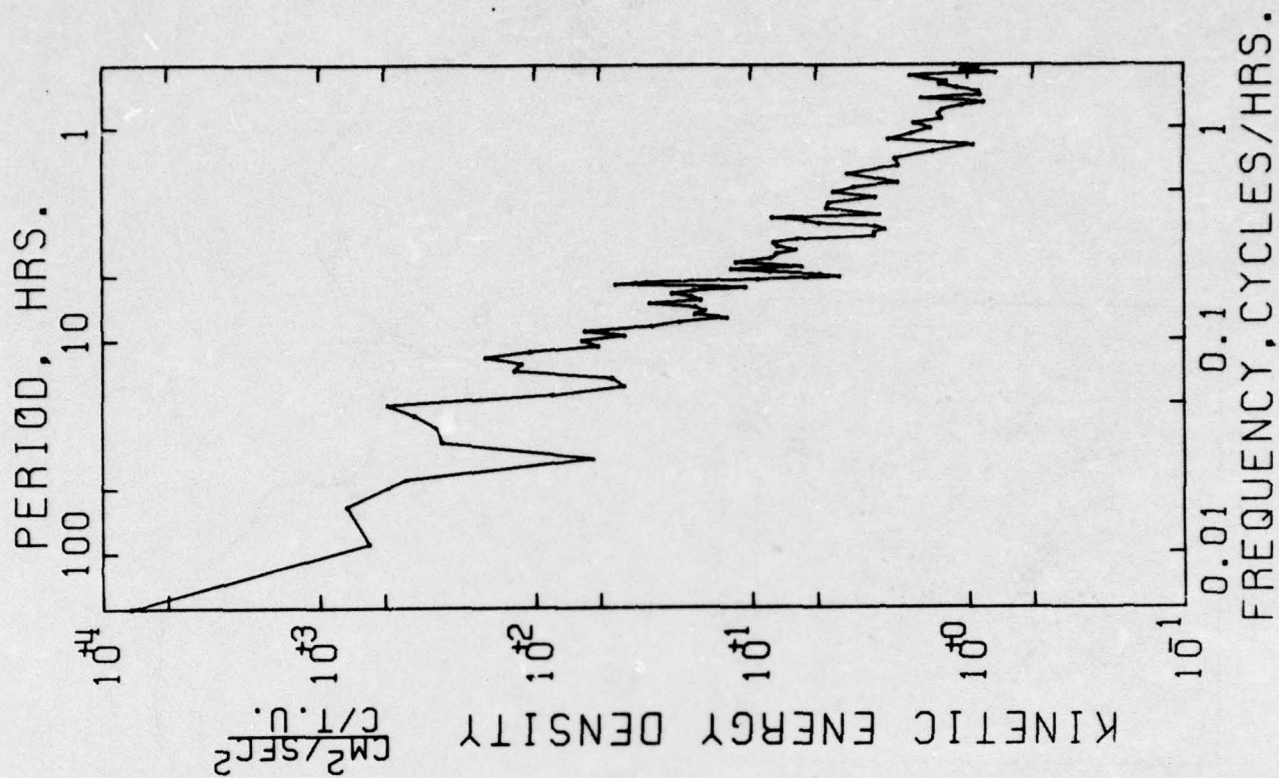
FROM 69- IV -29 20.18.30

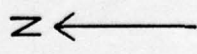
TO 69- V -15 10.18.30

DURATION 15 DAYS 14 H 0 M 0 S



AUTO SPECTRUM
2996F900 EAST COMP
2996F900 NORTH COMP
2372 METERS
69-IV-29 TO 69-V-15
1 PIECES WITH 729 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



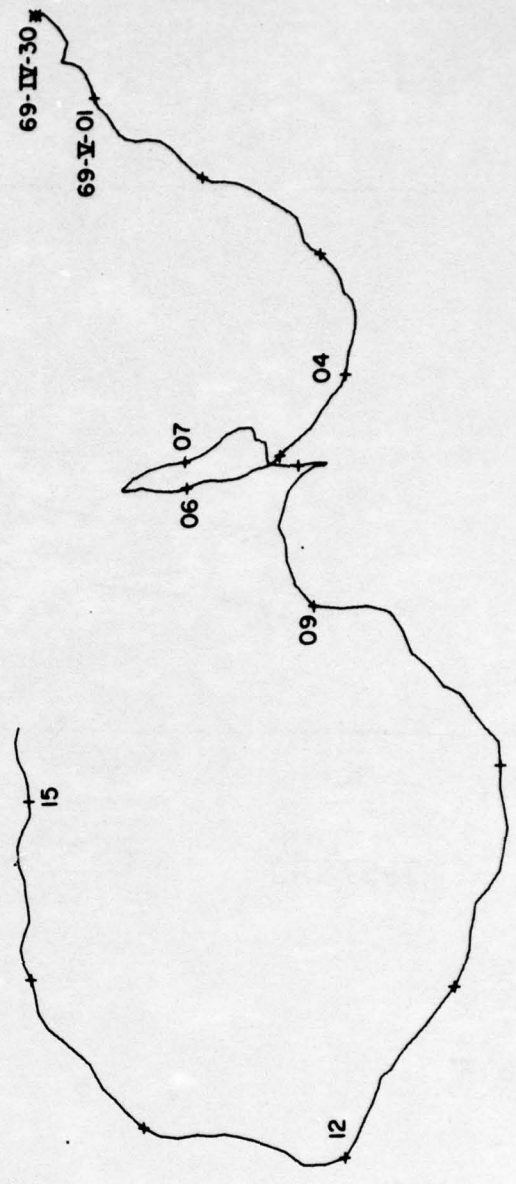
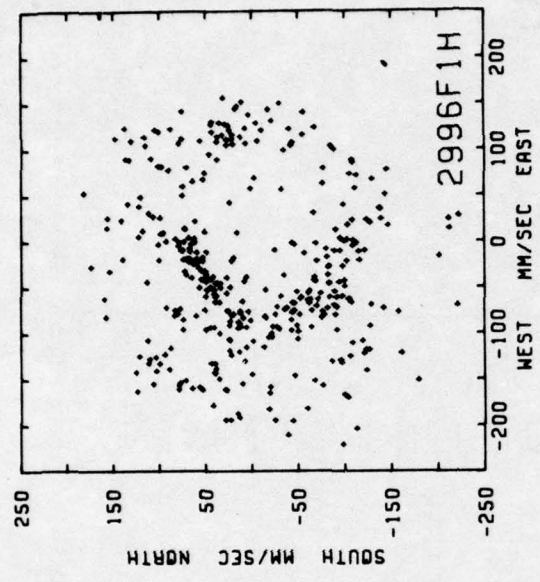


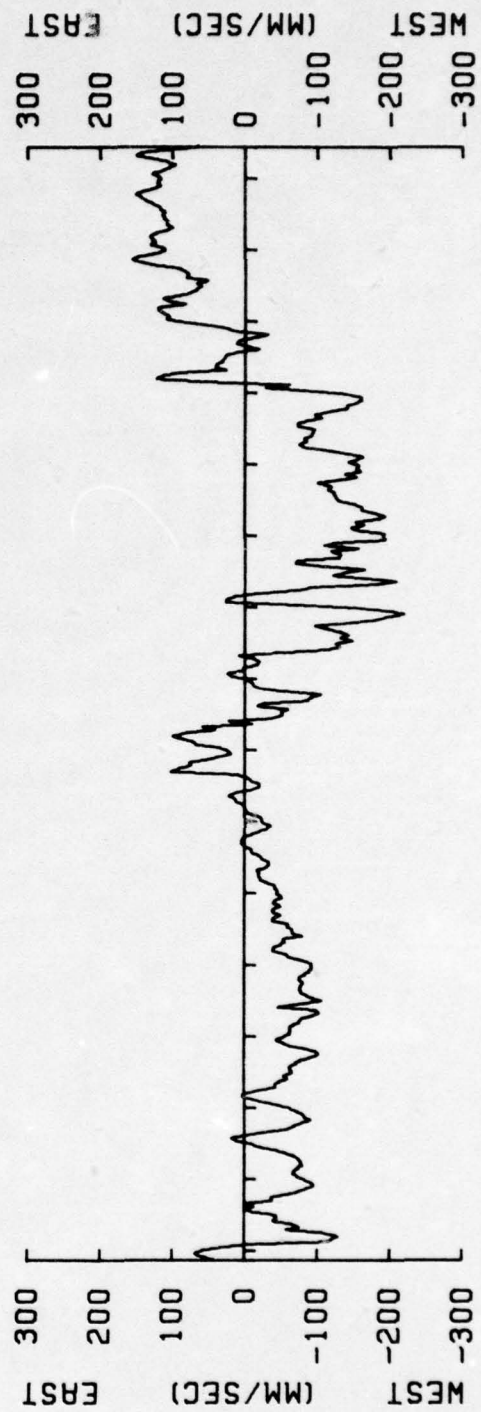
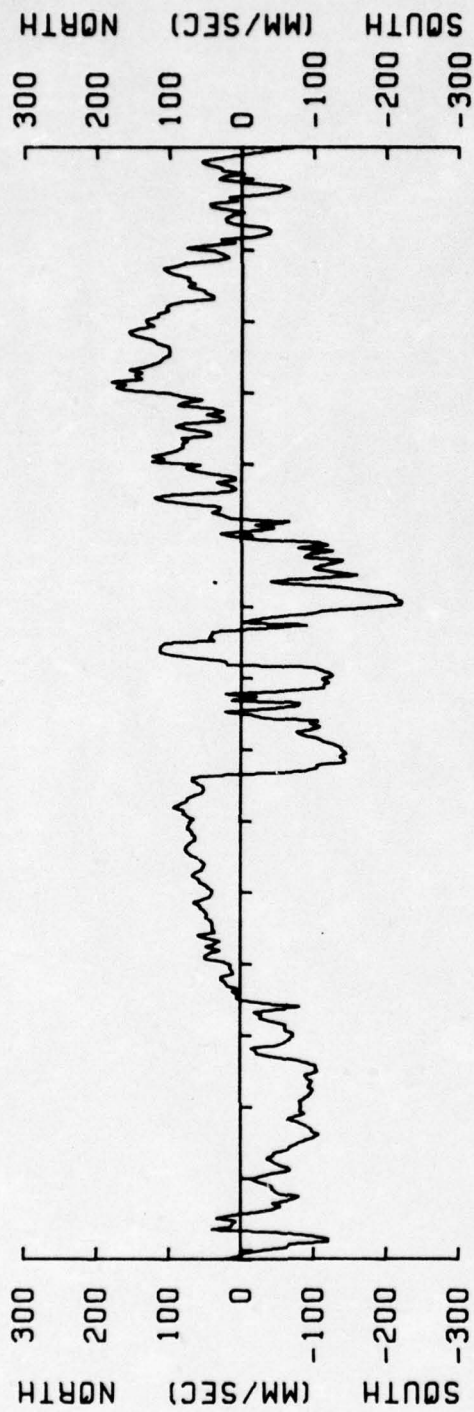
0 12
KILOMETERS

2996F1H

2372 M

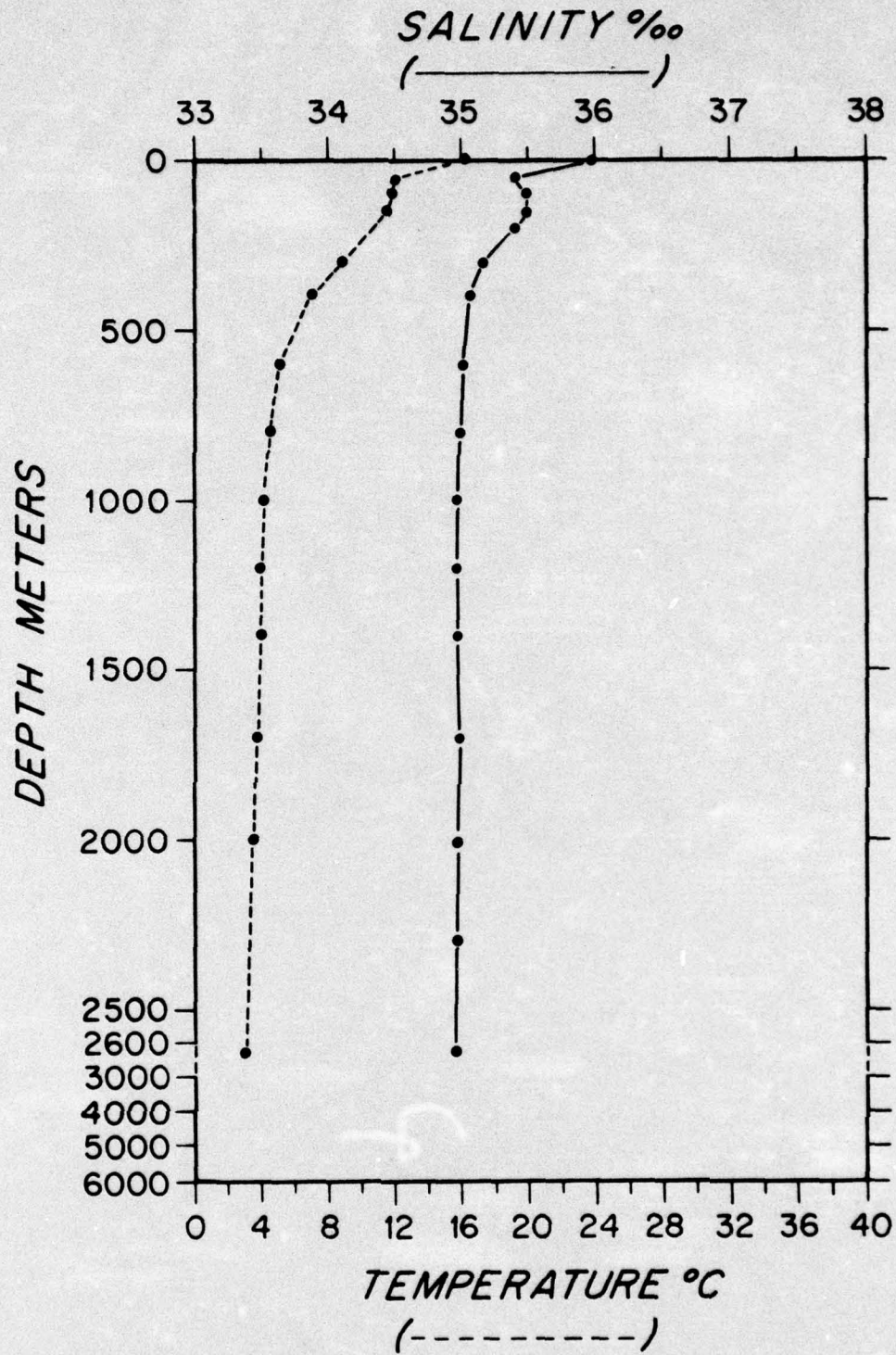
69- IV -30 TO 69- V -15



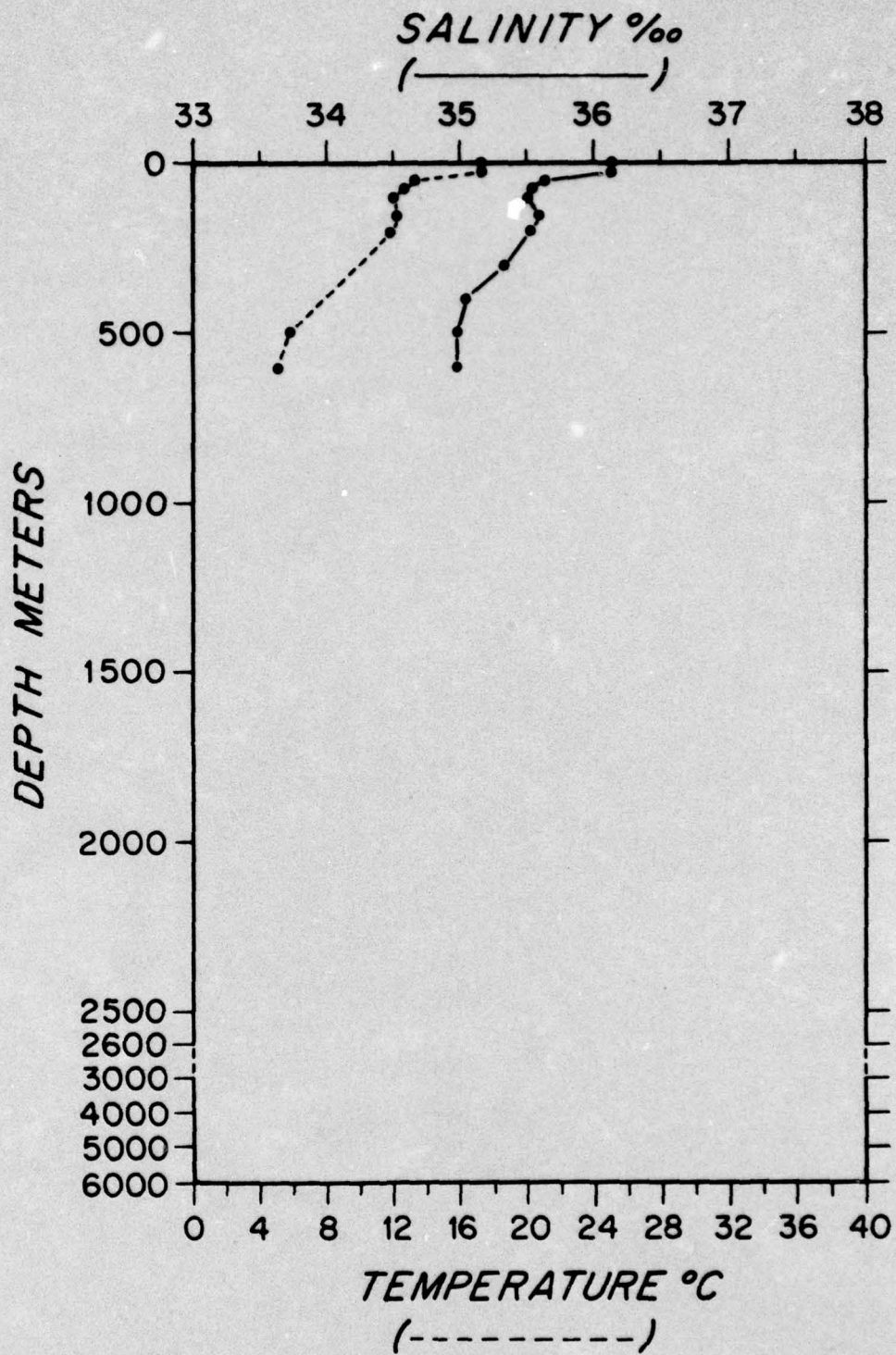


Hydrostation Data

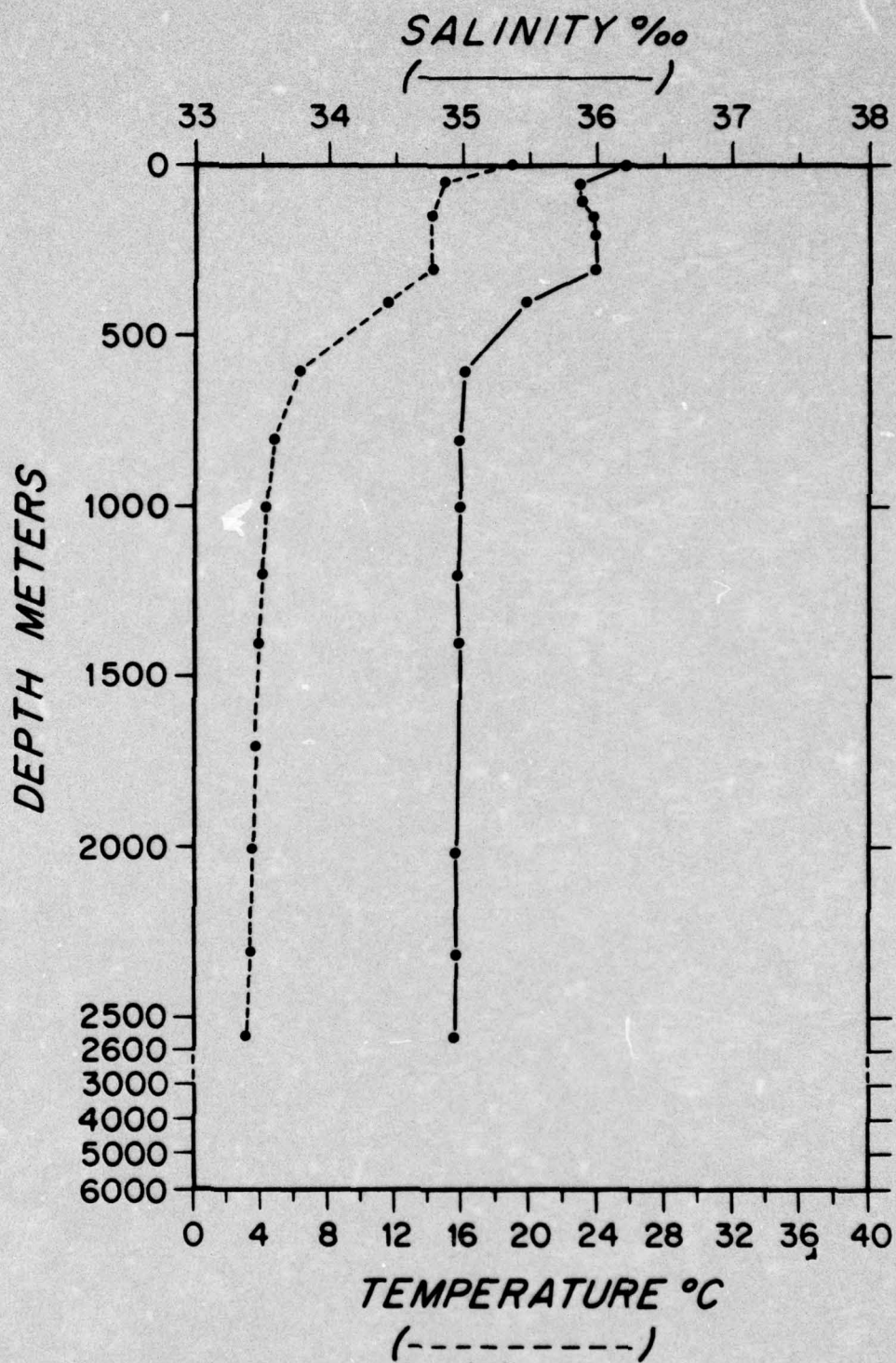
Number	Latitude	Longitude	Page
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CI-90-873	39° 11.3'N	70° 00.0'W	94
CI-90-878	39° 10.5'N	70° 00.0'W	96
CI-90-879	39° 10.5'N	70° 02.2'W	98
CI-92-896	39° 07.0'N	70° 00.0'W	100
CI-92-898	39° 02.3'N	70° 02.8'W	102
CI-92-903	39° 09.4'N	70° 06.5'W	104
CI-95-922	39° 10.5'N	70° 06.5'W	106
CI-95-924	34° 01.0'N	70° 04.7'W	108



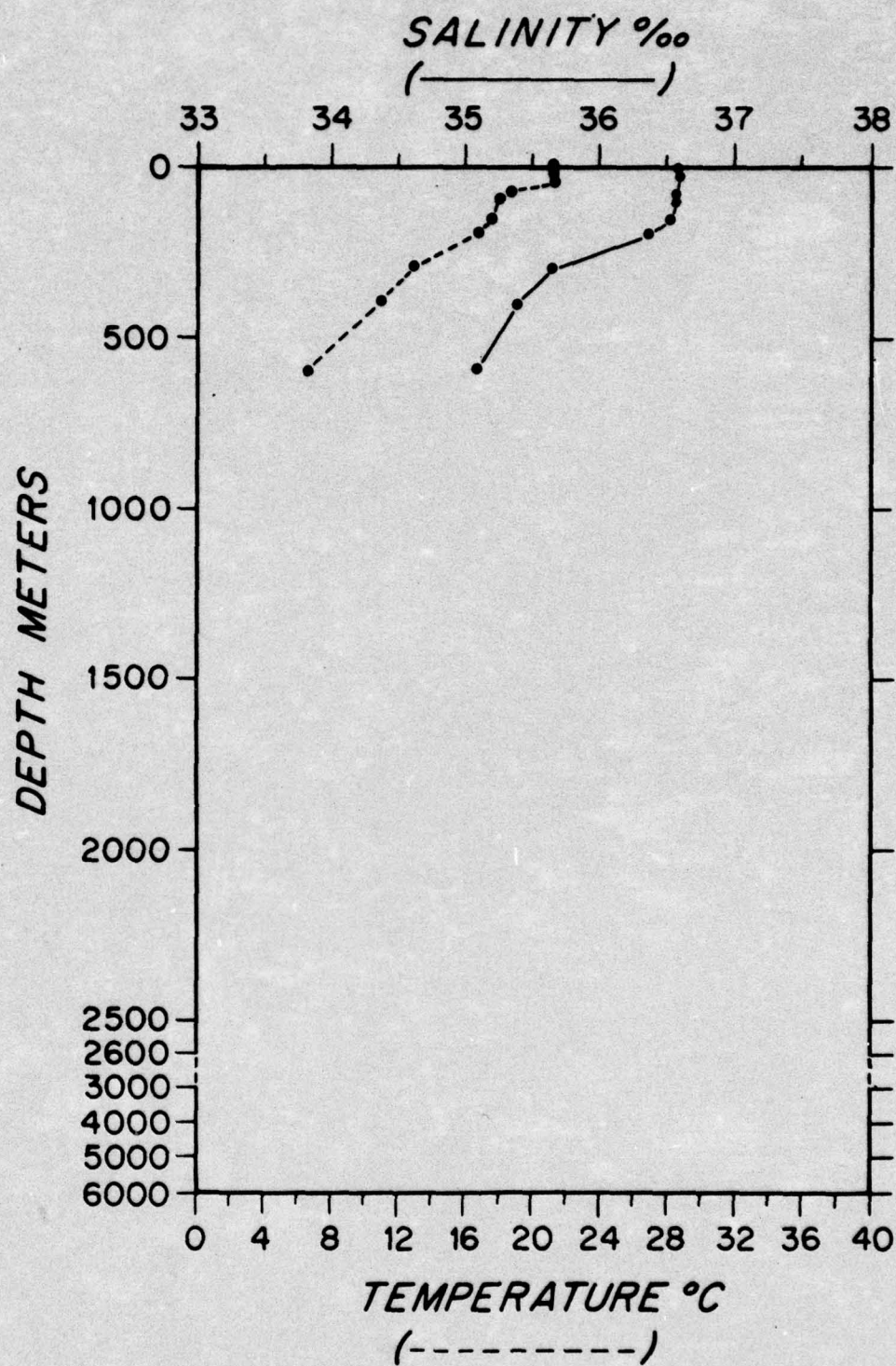
CI-090-872



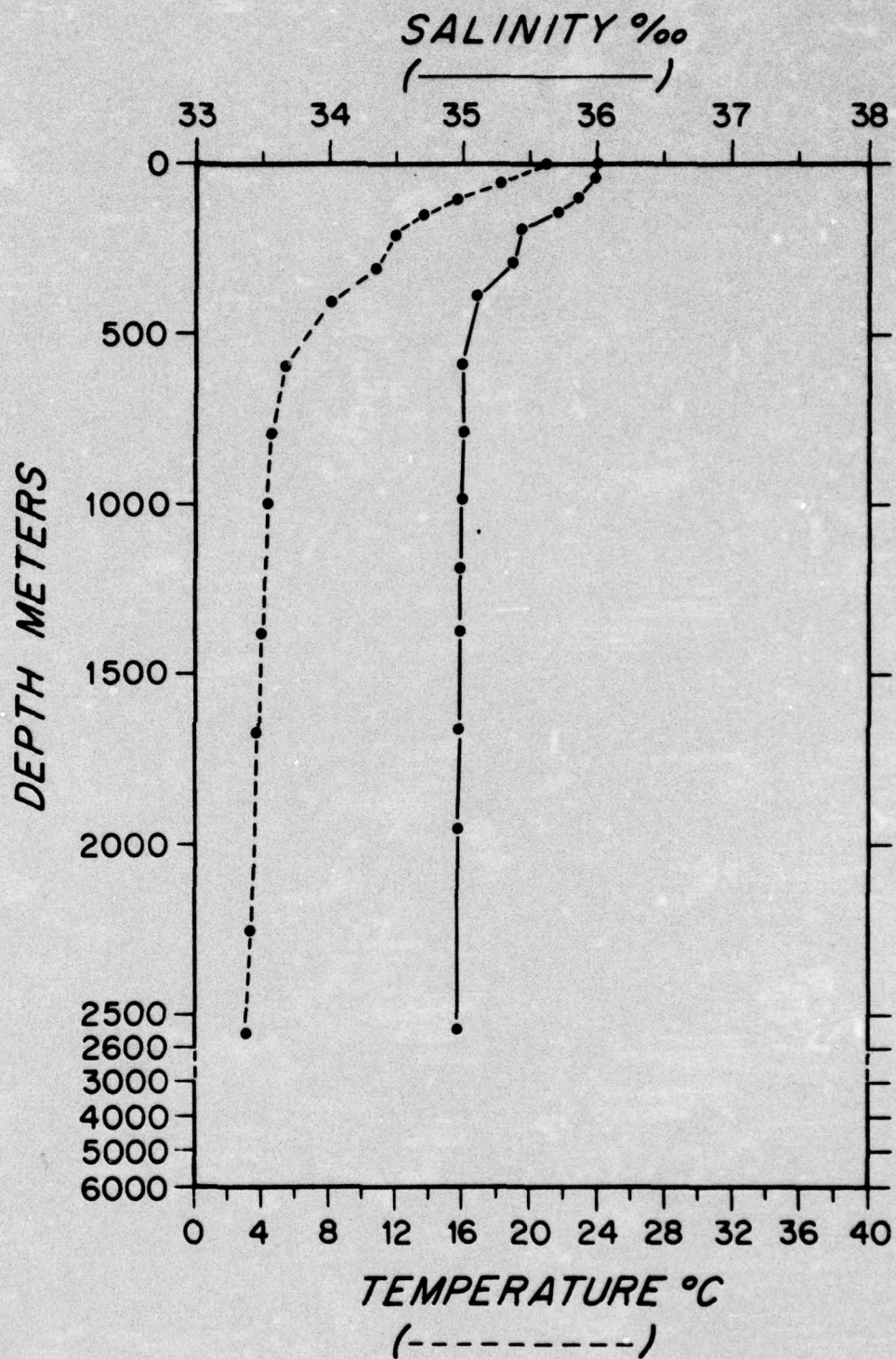
CI - 090 - 873



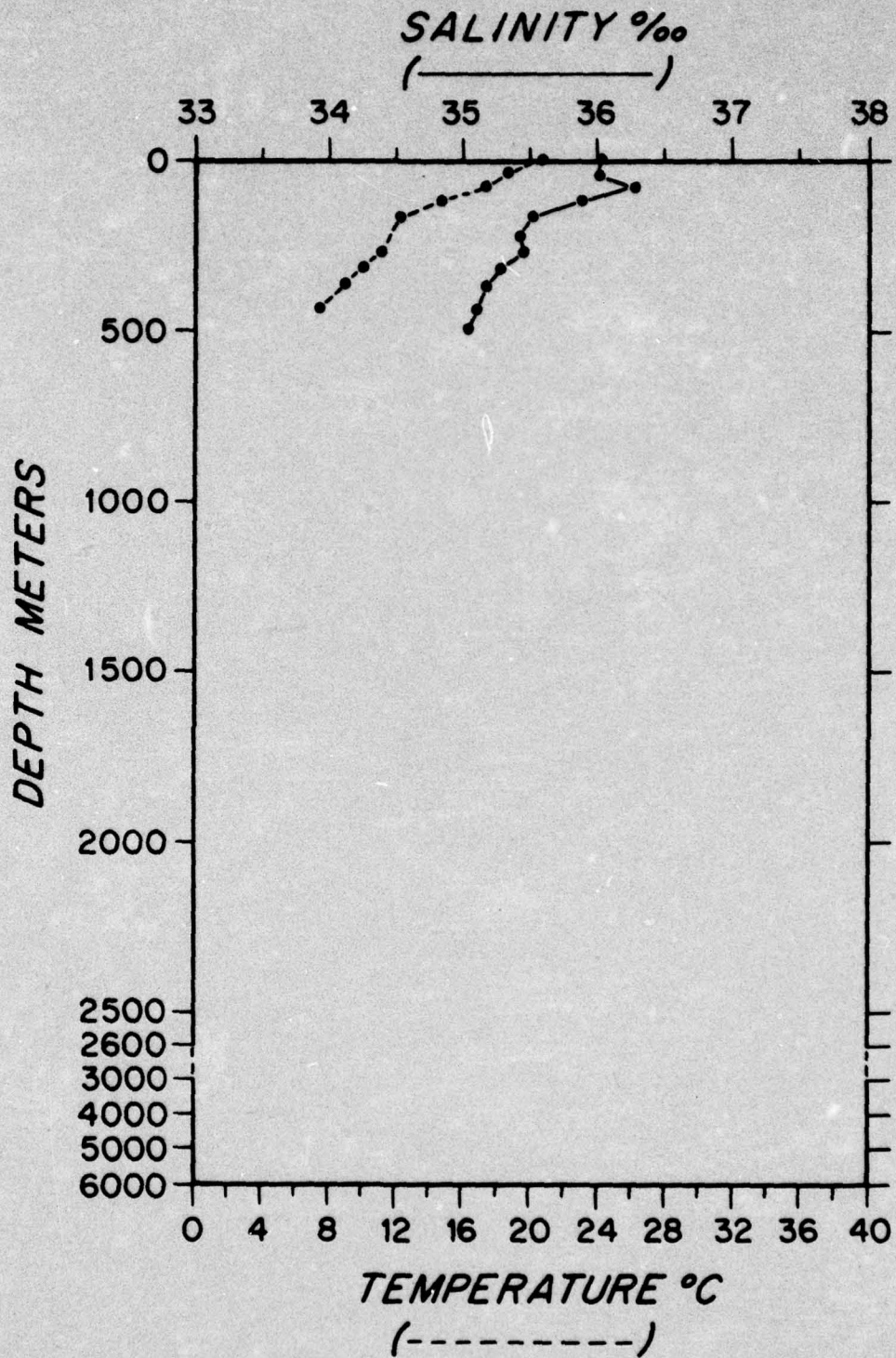
CI-090-878



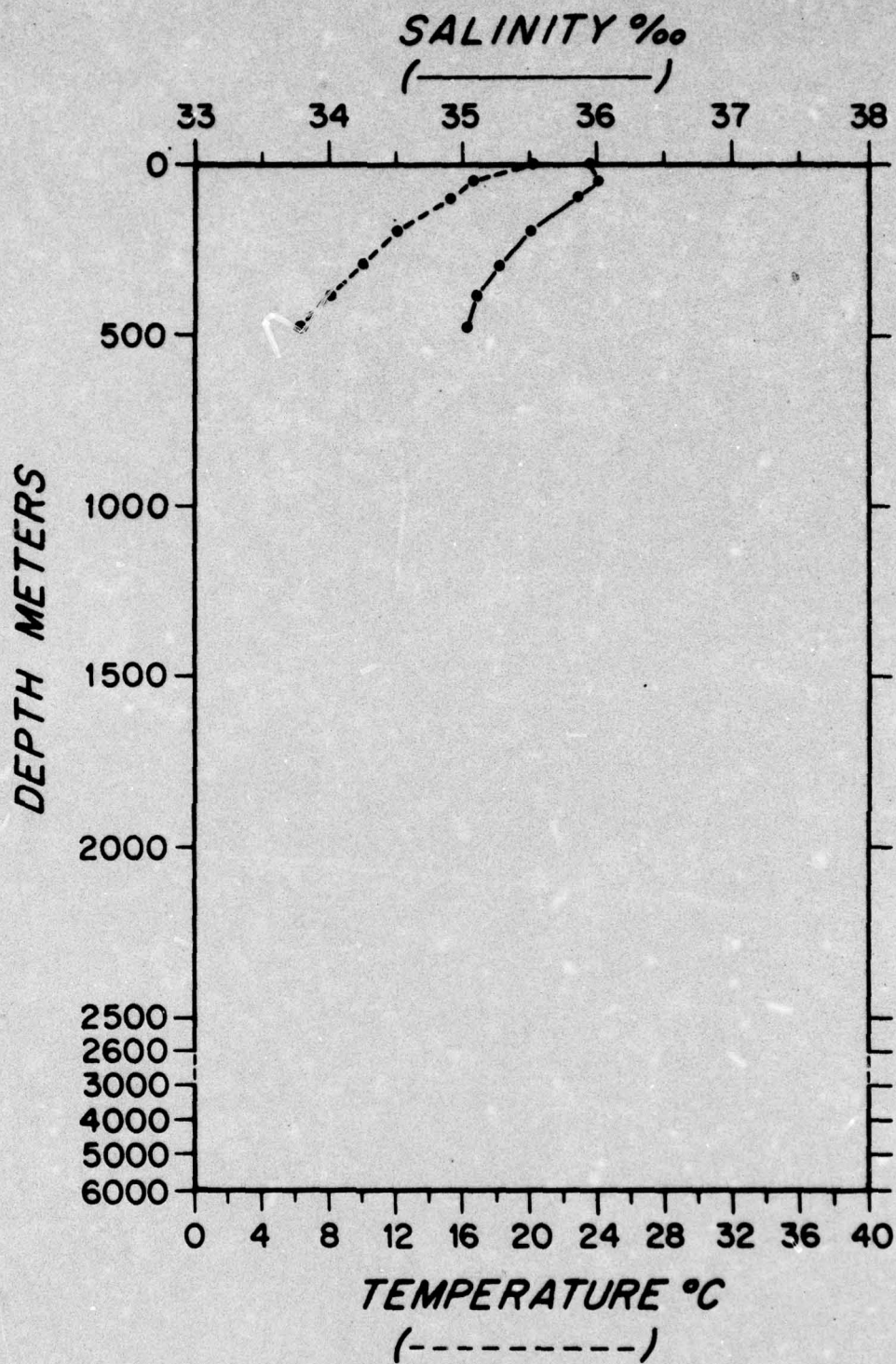
CI - 090 - 879



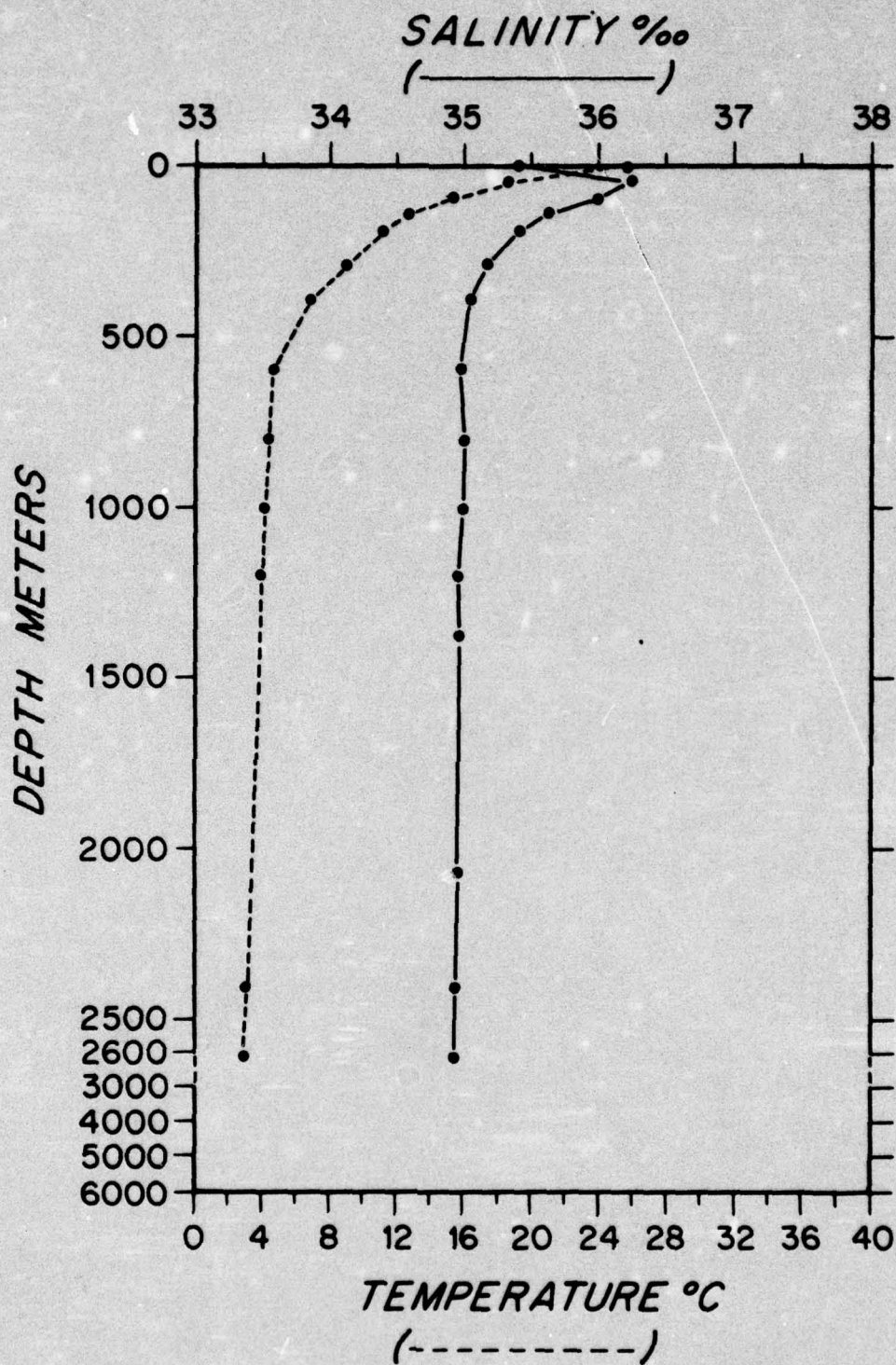
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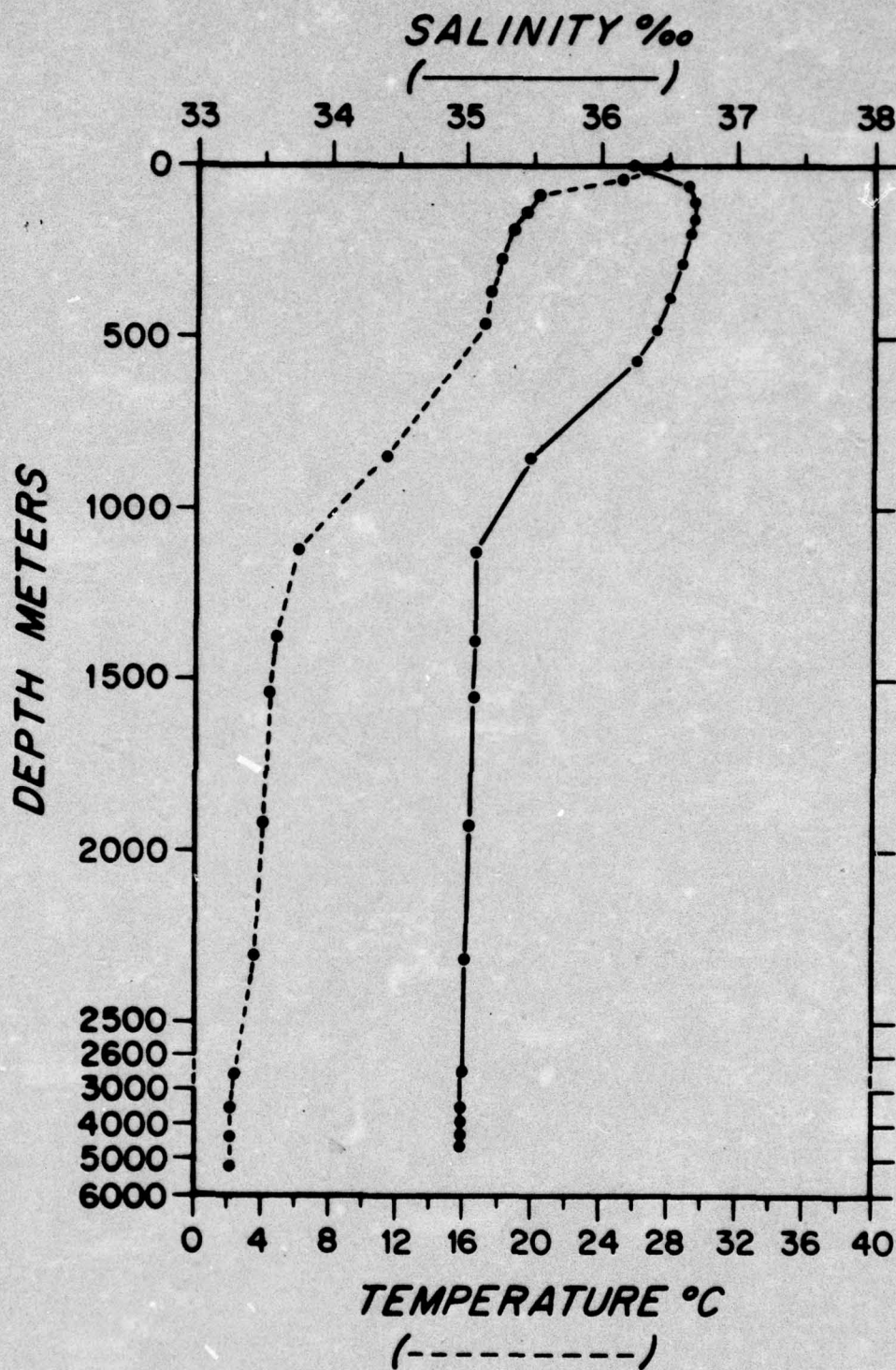
CI-092-898



CI - 092 - 903



CI - 095 - 922



CI-095-924

References

- Berteaux, H. O., and R. Heinmiller, 1969
Back-up recovery systems of deep-sea moorings. W.H.O.I. Ref. 69-7
(unpublished manuscript).
- Chausse, D., and S. Tarbell, 1974
A compilation of moored current meter and wind observations, Volume VII
(1968 measurements). W.H.O.I. Ref. 74-52 (unpublished manuscript).
- Maltais, J. A., 1969
A nine channel digital magnetic tape format for storing oceanographic
data. W.H.O.I. Ref. 69-55 (unpublished manuscript).
- Perkins, H., 1970
Inertial oscillations in the Mediterranean. Ph.D. Thesis W.H.O.I.-
M.I.T. Joint Program.
- Pollard, R. T., 1970
A compilation of moored wind and current meter observations. W.H.O.I.
Ref. 70-40 (unpublished manuscript).
- Pollard, R. T., and S. Tarbell, 1975
A compilation of moored current meter and wind observations, Volume VIII
(1970 Array experiment). W.H.O.I. Ref. 75-7 (unpublished manuscript).
- Singleton, R. C., 1969
An algorithm for computing the mixed radix Fast Fourier Transform.
I.E.E.E. Trans. on Audio and Electroacoustics, AU-17 (2) 93-103.
- Tarbell, S., 1974
A compilation of moored wind and current observations taken in
1967. W.H.O.I. Ref. 74-7 (unpublished manuscript).
- Tarbell, S., 1976
A compilation of moored current data and associated oceanographic
observations, Volume XI (Late 1969 measurements). W.H.O.I. Ref. 76-41
(unpublished manuscript).
- Tarbell, S., M. G. Briscoe, and D. Chausse, 1976
A compilation of moored current data and associated oceanographic
observations, Volume IX (1973 Internal Wave Experiment (IWEX)).
W.H.O.I. Ref. 75-68 (unpublished manuscript).
- Tarbell, S., and F. Webster, 1971
A compilation of moored current meter and wind observations, Volume V
(1966 measurements). W.H.O.I. Ref. 71-50 (unpublished manuscript).
- Volkman, G. H., 1970
Mooring summary 1967. W.H.O.I. Ref. 70-37 (unpublished manuscript).

References (cont.)

Webster, F., and N. P. Fofonoff, 1965

A compilation of moored current meter observations, Volume I.
W.H.O.I. Ref. 65-44 (unpublished manuscript).

Webster, F., and N. P. Fofonoff, 1966

A compilation of moored current meter observations, Volume II.
W.H.O.I. Ref. 66-60 (unpublished manuscript).

Webster, F., and N. P. Fofonoff, 1967

A compilation of moored current meter observations, Volume III.
W.H.O.I. Ref. 67-66 (unpublished manuscript).

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<p>Woods Hole Oceanographic Institution WHOI-76-40</p> <p>A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS, VOLUME X (EARLY 1969 MEASUREMENTS) by Susan A. Tarbell. 131 pages. May 1976. Prepared under ONR Contracts N00014-66-C-0241; NR 083-004 and N00014-76-C-0197; NR 083-400.</p> <p>Summaries of wind and current measurements from moored stations gathered by magnetic tape recording current meters and wind recorders in early 1969 are presented also selected hydro-station data from the same areas.</p> <p>Averaged wind and current quantities are presented in computer generated output as basic STATISTICS, SPECTRA diagrams, PROGRESSIVE VECTOR diagrams and EAST-NORTH component plots. The hydrostation data are presented as temperature and salinity values plotted against pressure.</p>	<p>1. Site D</p> <p>2. Current Data</p> <p>3. Moorings</p> <p>I. Tarbell, Susan A.</p> <p>II. N00014-66-C-0241; NR 083-004</p> <p>III. N00014-76-C-0197; NR 083-400</p> <p>This card is UNCLASSIFIED</p>	<p>Woods Hole Oceanographic Institution WHOI-76-40</p> <p>A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS, VOLUME X (EARLY 1969 MEASUREMENTS) by Susan A. Tarbell. 131 pages. May 1976. Prepared under ONR Contracts N00014-66-C-0241; NR 083-004 and N00014-76-C-0197; NR 083-400.</p> <p>Summaries of wind and current measurements from moored stations gathered by magnetic tape recording current meters and wind recorders in early 1969 are presented also selected hydro-station data from the same areas.</p> <p>Averaged wind and current quantities are presented in computer generated output as basic STATISTICS, SPECTRA diagrams, PROGRESSIVE VECTOR diagrams and EAST-NORTH component plots. The hydrostation data are presented as temperature and salinity values plotted against pressure.</p>	<p>1. Site D</p> <p>2. Current Data</p> <p>3. Moorings</p> <p>I. Tarbell, Susan A.</p> <p>II. N00014-66-C-0241; NR 083-004</p> <p>III. N00014-76-C-0197; NR 083-400</p> <p>This card is UNCLASSIFIED</p>	<p>Woods Hole Oceanographic Institution WHOI-76-40</p> <p>A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS, VOLUME X (EARLY 1969 MEASUREMENTS) by Susan A. Tarbell. 131 pages. May 1976. Prepared under ONR Contracts N00014-66-C-0241; NR 083-004 and N00014-76-C-0197; NR 083-400.</p> <p>Summaries of wind and current measurements from moored stations gathered by magnetic tape recording current meters and wind recorders in early 1969 are presented also selected hydro-station data from the same areas.</p> <p>Averaged wind and current quantities are presented in computer generated output as basic STATISTICS, SPECTRA diagrams, PROGRESSIVE VECTOR diagrams and EAST-NORTH component plots. The hydrostation data are presented as temperature and salinity values plotted against pressure.</p>	<p>1. Site D</p> <p>2. Current Data</p> <p>3. Moorings</p> <p>I. Tarbell, Susan A.</p> <p>II. N00014-66-C-0241; NR 083-004</p> <p>III. N00014-76-C-0197; NR 083-400</p> <p>This card is UNCLASSIFIED</p>	<p>Woods Hole Oceanographic Institution WHOI-76-40</p> <p>A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS, VOLUME X (EARLY 1969 MEASUREMENTS) by Susan A. Tarbell. 131 pages. May 1976. Prepared under ONR Contracts N00014-66-C-0241; NR 083-004 and N00014-76-C-0197; NR 083-400.</p> <p>Summaries of wind and current measurements from moored stations gathered by magnetic tape recording current meters and wind recorders in early 1969 are presented also selected hydro-station data from the same areas.</p> <p>Averaged wind and current quantities are presented in computer generated output as basic STATISTICS, SPECTRA diagrams, PROGRESSIVE VECTOR diagrams and EAST-NORTH component plots. The hydrostation data are presented as temperature and salinity values plotted against pressure.</p>	<p>1. Site D</p> <p>2. Current Data</p> <p>3. Moorings</p> <p>I. Tarbell, Susan A.</p> <p>II. N00014-66-C-0241; NR 083-004</p> <p>III. N00014-76-C-0197; NR 083-400</p> <p>This card is UNCLASSIFIED</p>
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